SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

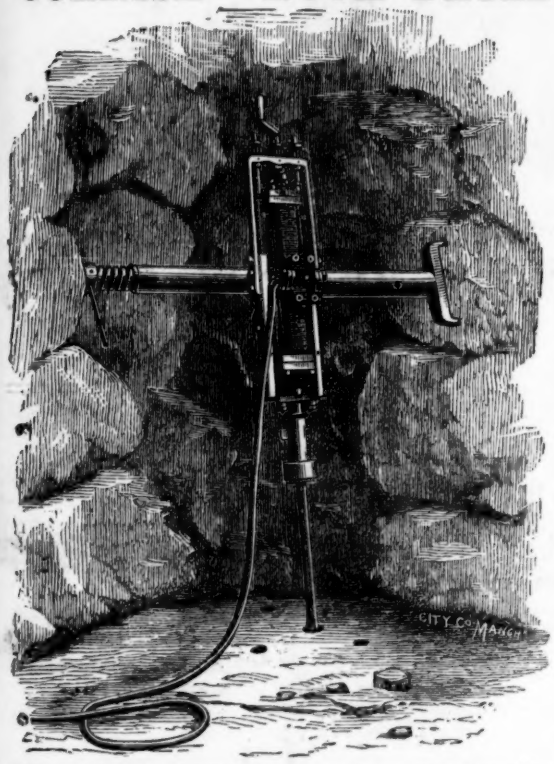
No. 2518.—VOL. LIII. LONDON, SATURDAY, NOVEMBER 24, 1883. PRICE (WITH THE JOURNAL) SIXPENCE BY POST £1 4s. PER ANNUM.

FIRST SILVER MEDAL, ROYAL CORNWALL POLYTECHNIC —Highest Award for Effectiveness in Boring, and Economy in the Consumption of Air

JUBILEE EXHIBITION, 1882.

THE PATENT

"CORNISH" ROCK DRILL.



This Drill has been constructed after a long practical experience in the requirements necessary for Mines, and has more than realised the expectations of its inventors. The chief objects in view were GREATER DURABILITY AND LESS LIABILITY TO DISARRANGEMENT; but it has also proved itself more EFFECTIVE AND ECONOMICAL.

We are now prepared to enter into any reasonable arrangement so as to enable users to judge of its merits, as we are thoroughly convinced that we can offer the BEST ROCK DRILL IN THE MARKET.

Further particulars on application to the Makers—

HOLMAN BROTHERS,
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CAMBORNE, CORNWALL.

THE PATENT

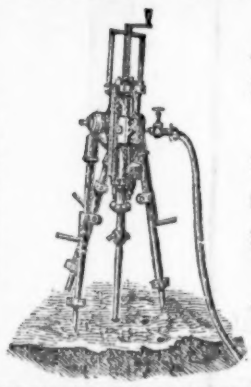
"ECLIPSE" ROCK-DRILL

AND

"RELIANCE AIR-COMPRESSOR."

First Silver Medal awarded at Boring Competition, East Pool Mine, Sept. 1883.

SILVER MEDEL—PARIS, 1878—HIGHEST AWARD



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Automatic, or by Hand, at will.
3-in. piston, 18-in. feed,
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We claim 40 per cent. greater effective drilling power.

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1877—Cornwall.
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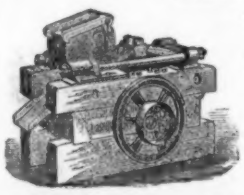

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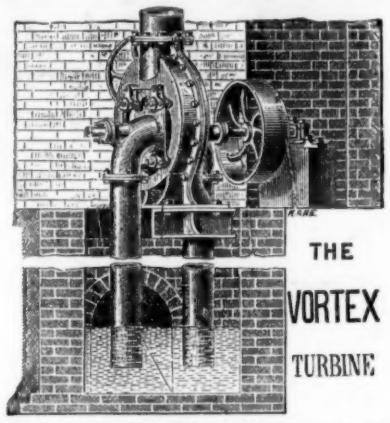

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A most efficient means of applying Water Power to all kinds of Machinery.

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"THE PATENT ACCESSIBLE"

CENTRIFUGAL PUMP

Is the only Pump from which the disc can be removed by breaking the joint on a single face only.

Manufactured by CHARLES L. HETT,
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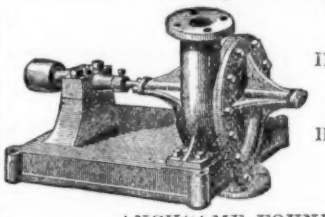
Maker of
IMPROVED CENTRE VENT.
TURBINES
WATER WHEELS,
Horse, Steam and Wind Power
PUMPS.



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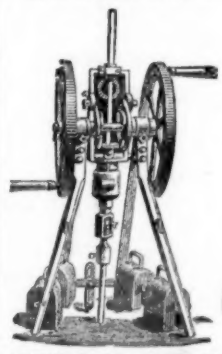
PERCUSSIVE ROCK PERFORATOR

(IMPROVED)
FOR HAND-LABOUR ONLY,
IN HARD ROCK.
FOR MINES, QUARRIES, AND GOVERNMENT CONTRACT WORK.

RATE OF PENETRATION IN GRANITE,
1½ to 2 inches per minute.

Price £50 complete.

For full particulars, apply to



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N.B.—A machine can always be seen at work (without notice) at the Albert Ironworks.

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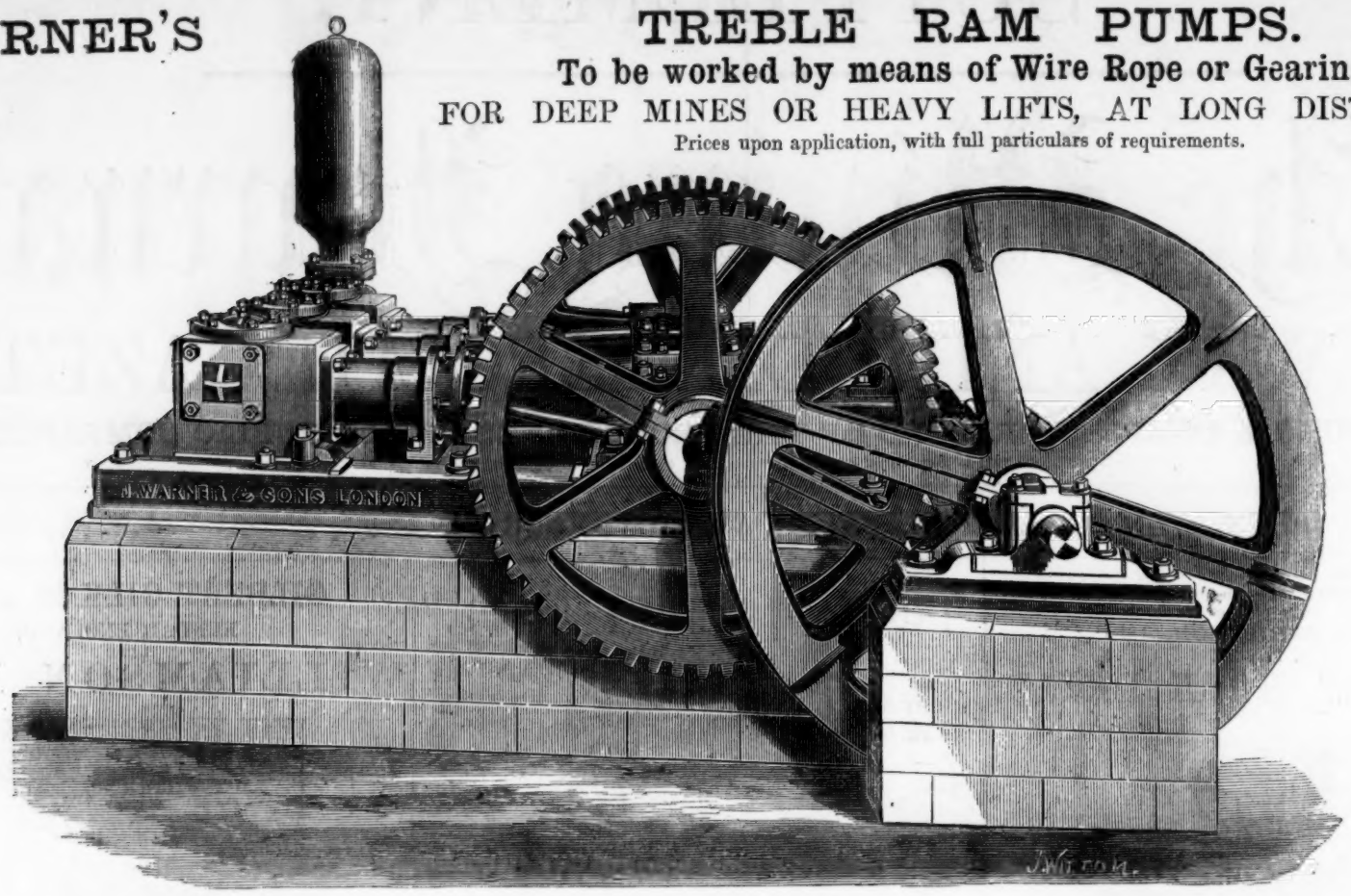
TREBLE RAM PUMPS.

To be worked by means of Wire Rope or Gearing.

FOR DEEP MINES OR HEAVY LIFTS, AT LONG DISTANCES.

Prices upon application, with full particulars of requirements.



As supplied to Messrs BOWES, of Springwell Colliery, Gateshead, for a Lift of (600) Six hundred feet vertical through two miles of pipes.

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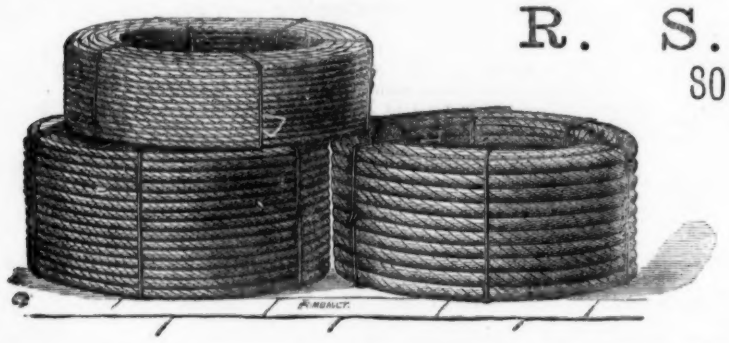

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Iron and Steel Ropes of the highest quality for Collieries, Railways Suspension Bridges, &c.

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PRIZE MEDALS AT Philadelphia, SYDNEY, AND ADELAIDE.
UNIVERSALLY ADMITTED BY ENGINEERS & USERS TO BE THE BEST DONKEY PUMP IN THE WORLD.
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DIA. OF STEAM CYL. 2½in 3in 4in 5in 6in 6in 6in 6in
LENGTH OF STROKE 2½in 3in 4in 5in 6½in 6in 6in 6in
CALLS PER HOUR 130 210 400 625 910 1260 1600 2000
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Patent Steel Trucks, Points and Crossings,

PORTABLE RAILWAY, STEEL BUCKETS, &c., &c.

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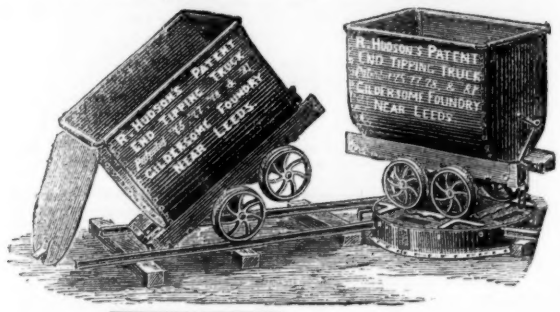
UPWARDS of 25,000 of these Trucks and Wagons have been supplied to the South African Diamond Mines; American, Spanish, Indian, and Welsh Gold, Silver, Copper, and Lead Mines; Indian and Brazilian Railways, and to Railway Contractors, Chemical Works, Brick Works, and Coal and Mineral Shippers, &c., &c., and can be made to lift off the underwork, to let down into the hold of a vessel, and easily replaced. They are also largely used in the Coal and other Mines in this country, and are the LIGHTEST, STRONGEST, and most CAPACIOUS made, infinitely stronger and lighter than wooden ones, and are all fitted with R. H.'s Patent "Rim" round top of wagons, requiring no rivets, and giving immense strength and rigidity. End and body plates are also joined on R. H.'s patent method, dispensing with angle-irons or corner plates.

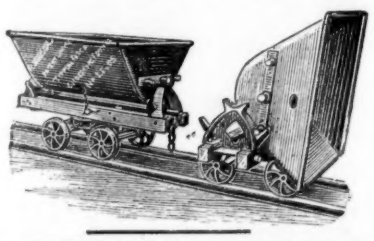
Patented in Europe, America, Australia, India, and British South Africa, 1875, 1877, 1878, 1881, and 1883.
N.B.—The American, Australian, Indian, and Spanish Patents on Sale.

CAN BE MADE TO ANY SIZE, AND TO ANY GAUGE OF RAILS.

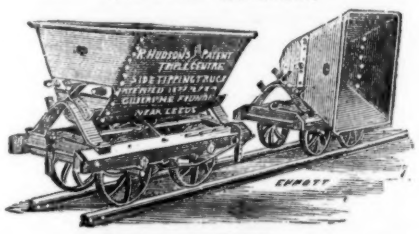
1.—PATENT STEEL END TIP WAGONS.



2. PATENT UNIVERSAL TRIPLE-CENTRE STEEL TIPPING TRUCK,
Will tip either SIDE or either END of rails.

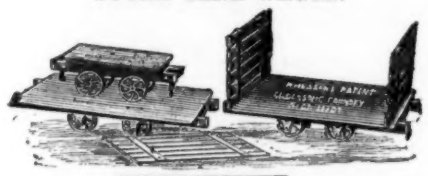


3.—PATENT TRIPLE-CENTRE STEEL SIDE TIP WAGONS.



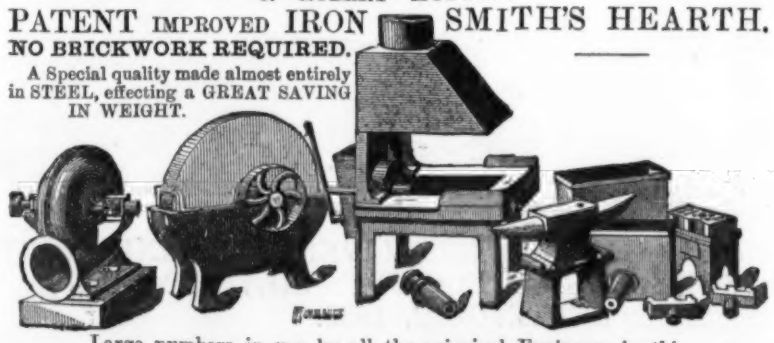
ONE man can EASILY tip ANY WEIGHT in these wagons.

4.—PATENT STEEL PLATFORM OR SUGAR CANE WAGON.



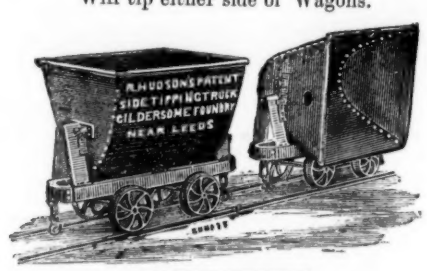
5.—PATENT STEEL CASK.
(As supplied to H.M. War Office for the late war in Egypt).
DOUBLE the STRENGTH of ordinary Casks without any INCREASE in weight.
(Made from 10 gals. capacity UPWARDS to any desired size.)

6.—ROBERT HUDSON'S
PATENT IMPROVED IRON SMITH'S HEARTH.
NO BRICKWORK REQUIRED.
A Special quality made almost entirely in STEEL, effecting a GREAT SAVING IN WEIGHT.

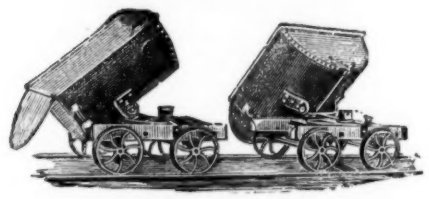


Large numbers in use by all the principal Engineers in this country and abroad.

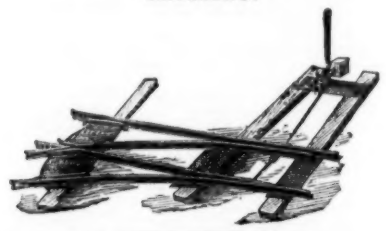
8.—PATENT DOUBLE-CENTRE STEEL SIDE TIP WAGONS,
Will tip either side of Wagons.



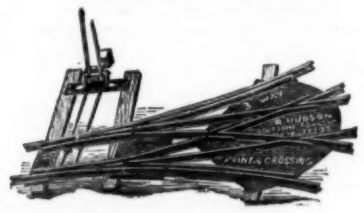
9.—PATENT STEEL ALL-ROUND TIP WAGON.



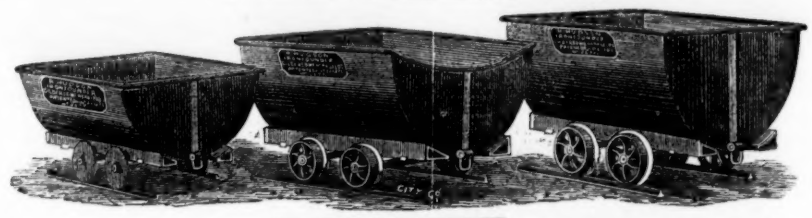
10.—LEFT-HAND STEEL POINT AND CROSSING.



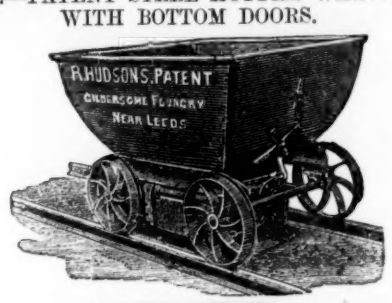
11.—RIGHT AND LEFT-HAND STEEL POINT AND CROSSING.



7.—PATENT STEEL MINING WAGONS.



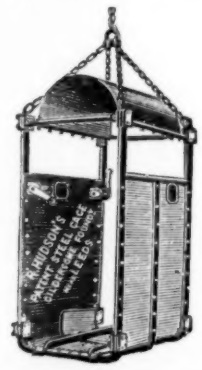
12.—PATENT STEEL HOPPER WAGON, WITH BOTTOM DOORS.



13.—PATENT STEEL HOPPER WAGON.

14.—SELF-RIGHTING STEEL TIP BUCKET.
(The "CATCH" can also be made SELF ACTING if desired.)

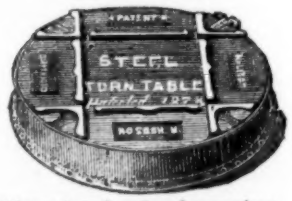
15.—STEEL CAGE.



16.—PATENT STEEL WHEELBARROWS.
Made to any Size.
Lightest and Strongest in the Market.

A great success.

17.—STEEL SELF-CONTAINED TURNTABLE.



(Also made in CAST Iron for use where weight is not a consideration.

18.—"AERIAL" STEEL WINDING TUB.

Largely employed in the South African Diamond Fields.

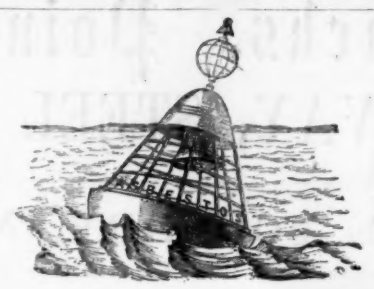
No. 19.—PATENT STEEL CHARGING BARROW,
DOUBLE the STRENGTH & much LIGHTER than ordinary Barrows

ALL KINDS OF BOLTS, NUTS, AND RIVETS MADE TO ORDER ON THE PREMISES.

BELL'S ASBESTOS.

BELL'S PATENT ASBESTOS BLOCK PACKING, for Marine and Pumping Engines. This packing has been specially designed to overcome the difficulties experienced by marine engineers and others in the practical working of engines of the most modern type of construction. The greatly increased skill and workmanship now obtained in the construction of engines and boilers have led to a rapid increase in the working pressure, the object being the attainment of a high rate of speed combined with economical working, the practical advantage of which, however, cannot be realised unless the Packings are so constructed as to avoid stoppages at sea for the purpose of re-packing the stuffing boxes.

It is now a recognised fact that the most perfect heat-resisting material suitable for the purpose of a Packing is Asbestos, but to ensure a successful application of this fibre, great skill is required in its selection and manufacture. In this Packing the Asbestos is woven into a stout cloth, and owing to the peculiar way in which it is manipulated, great elasticity is imparted to the Packing. So successfully has this been done, that with light screwing, it has been found in practice that little or no lubricant is required to ensure a minimum amount of friction, and to keep the rods from over-heating. An improved vacuum is always maintained by the use of this packing, which meets with unqualified approval wherever it is applied.



This packing is made in four forms to meet various requirements, viz., as Fig. 1, square; 2, round with solid rubber core; 3, with tubular rubber core; 4, without core, but with rubber inlaid.

As these packings are extensively imitated, and as it is a common practice among dealers and agents to supply the cheaper manufactures at my list prices, users are requested to see that the packing supplied to them bears my trade mark.

BELL'S PURE ASBESTOS PLAITED YARN PACKING. This is the best and most economical Piston Packing in the market for High and Low Pressure Stationary Engines. Of course there are many imitations of a Packing so universally approved of, but I am the Original and Sole Manufacturer of the genuine article.

Every 10 ft. length of this Packing bears a label with my Trade Mark, and users are recommended to see that this label is attached, to secure their obtaining the material they have ordered.

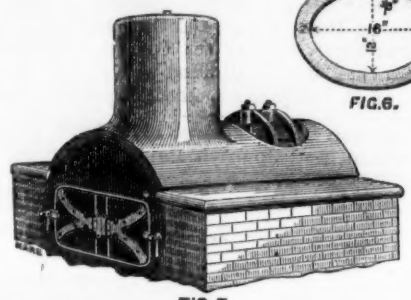


FIG.5.

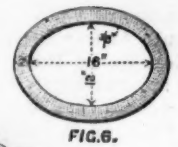


FIG.6.

FIG.1.

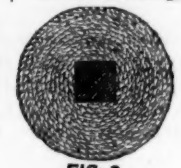


FIG.2.

FIG.4.

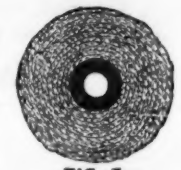


FIG.3.

BELL'S ASBESTOS BOILER COVERING COMPOSITION (Fig. 5), for Coating the Pipes and Boilers of every kind of Marine and Stationary Engine. Non-combustible, and easily applied when steam is up; adheres to metals and preserves them from rust; prevents the unequal expansion and contraction of boilers exposed to weather; covers 50 per cent. more surface than any other coating, and is the most durable material of its class.

The composition is supplied dry, and is only to be mixed with water to the consistency required for use.

The following Testimonial refers to the Asbestos Boiler Covering Composition;—

The Maxim-Weston Electric Company (Limited), 29, Bankside, London, S.E., Jan. 4th, 1883.

Mr. John Bell, 118, Southwark Street, S.E.

DEAR SIR,—In answer to your request, I beg to inform you that I find the thermometer placed 3 ft. above the boilers now stands at 93°; before your covering was put on it used to stand at 126°. With regard to the saving of fuel, I am unable to speak very accurately, as the boilers were not working long enough before being covered to ascertain the amount of fuel that would be consumed in an ordinary run; but I feel quite justified in saying that we burn less by about 5 cwts. per night than we were doing, and I shall be glad at any time to show the boilers to anyone who may wish to see them, as I consider yours the best covering that I have up to the present seen.

Yours faithfully,

(Signed) J. H. CUNDALL, Works Manager.

BELL'S ASBESTOS and INDIA-RUBBER WOVEN TAPE and SHEETING, for making every class of Steam and Water Joints. It is the most efficient material for making bilge water pipe joints. It can be bent by hand to the form required without puckering, and is especially useful in making joints of manhole and mudhole doors; also for large "still" joints where boiling fat and steam have to be resisted. It is kept in stock in rolls of 100 ft., from ⅛ in. (Fig. 6) to 3 in. wide, and any thickness from 1/16 in. upwards. Manhole covers can be lifted many times before the renewal of the jointing material is necessary.

The same material is made up into sheets about 40 in. square, and each sheet bears my Trade Mark, without which none is genuine.

BELL'S ASBESTOS YARN and SOAPSTONE PACKING for Locomotives, and all Stationary Engines running at a very high speed with intense friction.

The following Testimonial refers to this packing;—

Festiniog Railway, Locomotive Superintendent's Office, Portmadoc, January 13th, 1883.

Mr. John Bell, 118, Southwark-street, S.E.

DEAR SIR,—I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed better than we expected. We have a locomotive packed with it, which has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting packing. The Asbestos Yarn we find is very useful, and answers admirably.

Yours truly, (Signed) W. WILLIAMS.

Every 10 ft. length of Bell's Asbestos Yarn and Soapstone Packing bears a special label with the Trade Mark, and engineers are earnestly requested to see that this label is attached, to prevent imposition by worthless imitations.

The engineer of a world-renowned firm writes:—"There is not, nor can there be, any doubt as to the excellence of your Asbestos and Indiarubber Woven Sheeting—as a jointing material it is unrivalled."

The engineer of a large colliery writes:—"I would in all candour say that your Asbestos and Indiarubber Woven Sheeting is first-rate for joints. In my 25 years' experience I have not seen anything like it. I highly recommend it to all those who have to do with steam engines."

It is very necessary to guard against imitations of this useful material, and to secure themselves against being supplied with these cheaper articles at my price, users are recommended to see that every 10 ft. length of the Asbestos Tape purchased by them bears my Trade Mark.

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD, for Dry Steam Joints, made of the best Asbestos fibre, is well-known for its toughness and purity, and is absolutely free from the injurious ingredients frequently used to attain an appearance of finish, regardless of the real utility of the material. Made in sheets measuring about 40 in. square, from 1-64th in. to 1 in., and ½ millimetre to 25 millimetres thick. Each sheet bears my Trade Mark.

To avoid spurious imitations, and to secure the receipt of genuine goods, all orders should be sent direct to the undermentioned addresses, and not through Agents or Factors.

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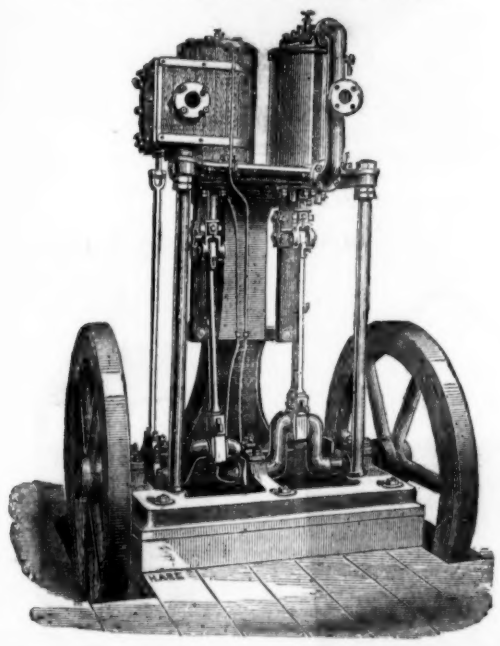

As an instance of the actual work done by this Machinery in various kinds of ground, some of it the hardest rock, it may be mentioned that in Cornwall, irrespective of the work performed by the "Champion" Rock-borers and Air-compressors purchased by various Mines, the drivage, rising, sinking, and stoping done by contract by the Proprietor with his own Machinery now amounts to over 1150 fathoms.

Several of these Air-compressors, ranging from 3½ to 12 tons in weight may be seen in constant work in the Camborne Mining District.

R. H. HARRIS,

ENGINEER,

63, QUEEN VICTORIA STREET, LONDON.

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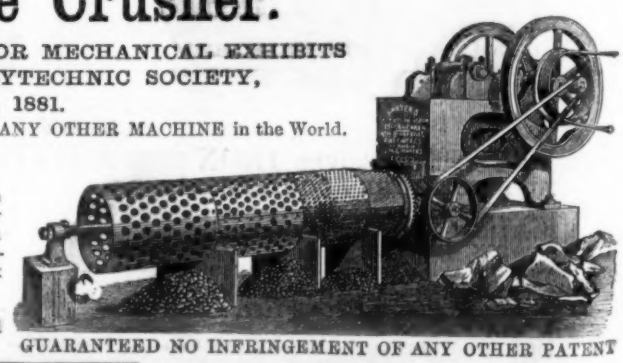
NOTE THIS FACT.

To Mr. Baxter, Leeds. *Cinderford, Feb.* 13, 1883.

DEAR SIR,—I am pleased to be able to tell you that the Machine works splendidly. We are breaking 16 trucks a day now, and we thought it a good day's work to do 10 a day with the old Machine, so you can see the difference. I had a gentleman looking at it yesterday, and he was surprised to see it work so easily.

Yours truly, E. ORGAN.



The above refers to one of our 16 by 9 Machines we supplied to replace an "Improved Blake" 15 by 9 Machine.

GUARANTEED NO INFRINGEMENT OF ANY OTHER PATENT

AWARDED THE ROYAL MANCHESTER, LIVERPOOL, AND NORTH LANCASHIRE AGRICULTURAL SOCIETY'S SILVER MEDAL, 8TH OF SEPTEMBER, 1882.

FOR ILLUSTRATED CATALOGUE AND FULL PARTICULARS ADDRESS TO THE PATENTEES AND SOLE MAKERS,

W. H. BAXTER & CO., ALBION STREET, LEEDS.

Original Correspondence.

MINING INDUSTRY IN TURKEY.

SIR,—Referring to the letter under this head, which appeared in your valued *Mining Journal* of Oct. 6, a friend of mine having read the same will feel obliged to you if you will kindly allow a space in your columns for the following reply:—"It is evident to us here who are 'au courant' of what is going on in Turkey that the author of this letter emphatically takes the part of revenging some English people connected with demands of concessions, who failed, however, in their pursuits by total want of tact and knowledge about these matters, after spending their time here in vain and squandering away their money, believing to succeed on the mere reliance of their nationality, which, instead of helping them, was in each case to their disadvantage." The writer of the letter above referred to completes his revenge in throwing distrust on the minds of European capitalists in general, who otherwise would be inclined to participate in enterprises of similar nature in this country.

As regards the Boracite Mines, which the above correspondence alludes to, of having created a good deal of unpleasantness to people interested in them having invested much capital in the venture, we know only of one definite concession of this kind having been granted by the Government some years ago to a Pole, who, after having worked the mine a couple of years, became a "millionnaire," and is daily increasing his fortune, without there being any attempt on the part of the Government to deal *high-handedly* with this person, but affording him, on the contrary, all possible facilities even beyond the terms of his concession. The example of such success made people anxious of obtaining similar concessions, at the same time it made the Government grow wiser—not to be so easy in divesting itself of such sources of wealth, and to render more difficult the acceptance of any proposals about mining and other enterprises, which were made by scores of people who had some support from Embassies here. The only facility granted by the Government, in order to throw some sand in the eyes of these Embassies, and not to refuse altogether to take the demand of their *proteges* into consideration, was to the effect that "permissions" should be granted to such *proteges* on condition that they should work mines in the Empire for a fixed period, and to turn out in the time specified a sufficient quantity of ore to repay the explorers in their pursuits for expenses incurred and loss of time, which in every case was fully compensated by the Porte.

The Government, on the other hand, reserved a right to decide at the expiration of the time fixed upon, whether such permission should be converted into a final concession to be granted to the explorers in accordance with all the formalities required by the laws of the Empire, or to grant such concession to any other competitor. On these terms of conditions an English banking firm, since bankrupt, finding themselves in difficulties, in order to recoup their losses and to be once more on their legs, obtained one of these permissions through the influence of the English Ambassador, to work a mine of boracite in the vicinity of the one already worked by the Pole. The results were quite as good, if not better, than those of the Pole, and it was quite clear that if the firm referred to could obtain the final concession for this mine, they could have got over their difficulties and pocketed some thousands of pounds. All efforts were, therefore, made by the Ambassador to this effect; he succeeded so far that he and and his *protege* were invited to dine one evening with the Sultan, and "entre la poire et le fromage" the Sultan would be asked to grant the so much coveted final concession without allowing the matter to pass through the formalities required. Although the plan was cleverly drawn up, these gentlemen counted without their host, as the Sultan, very anxious to save the *protege* from his approaching discomfiture could not do anything in the matter, reminding the Ambassador of the "little incident" respecting Michel Pacha's Firman of the Constantinople Quay Concession, in which business this diplomatist had something to do; if the *protege*, therefore, wished to obtain the final concession of the Boracite Mines, which he had worked, he should apply to proper quarters to allow the Sublime Porte and the Minister of Public Works to examine his demand, and, if deemed acceptable by the State, he—the Sultan—would promise to do everything in his power to accelerate the granting of this final concession. These formalities, as requested by the Sultan, once gone through, were sure not to be favored by the "proper quarters," as it was quite certain that the Government, after its experience, would not be so foolish as to part with such a mine, for the mere benefit of any private individual.

As to the "little incident" referred to about the concession of the Constantinople Quays, this is another illustration of the manner in which foreigners intend of succeeding in obtaining concessions of this Government. A Michel Pacha, some 20 years ago while in the capacity of captain in the service of the Messageries Steamship Company of France, had the good luck of obtaining the so-called concession of the lighthouses of the Empire, which made him since an "archimillionnaire." Having plenty of influence in the palace, he solicited from the Sultan, in competition with a group of English financiers, the concession to build quays along the shores of the Golden Horn and Lower Bosphorus, and to erect docks and warehouses. This enterprise, as said before, was eagerly sought by some English capitalists, supported by the same Ambassador who interfered in the Boracite Mine business. By a "tour de force" Michel Pacha, unknown to the English Ambassador, succeeded in obtaining the *Irideé* of the Sultan direct. As soon as it reached the Ambassador's ears complaints were made by him to the Sultan, giving him to understand that the concession given to Michel Pacha was *nil* and void, not having been granted according to the laws existing for such business, and that the formalities required to be made to proper quarters had not been fulfilled. Michel Pacha was, therefore, asked to return to the Sultan the firman, which he willingly complied with, and the matter remained and is still in abeyance.

Thus this enterpise that would have brought such a source of wealth to the country, as some four millions of sterling were going to be spent, could not be brought to a close owing to the jealousy existing here among nationalities, which unfortunately, as long as this evil is allowed to move about, will always hinder business and progress of this country so much talked of. These incidents prove that unexplained motives or other hindrances the above-mentioned correspondent alludes to, are not exactly the causes of an evil proceding from our nation, and that all the bad does not come from the Goverment. It is, therefore, only right and just that the Government, looking at this state of things, should be wide-awake, and reserve for itself the right of action in considering thoroughly any European proposal about concessions in this country before granting same, as in nine cases out of ten the drafts of such demands are so cleverly put down that their actual meaning is not so much the concession in itself than to entrap the Government in an "embroglio," and claim afterwards damages, The unfortunate affair of Hirch's railways is there to prove it; our poor Government find itself owing about half a "milliard" francs without having touched a farthing !!! besides it is now involved in a law-suit about claims for damages set up by Hirch, which case ten to one will be lost by the Government, which will have to pay some millions of francs in the bargain out of its own pockets.

What liberal encouragement then can the Porte afford to people such as described when it is well known that if any foreigner solicits concessions of any kind, and supported in each case by some ambassador; the idea is to fill the pockets of these Embassy's *proteges*, and to empty those of our Government. Concessions applied for by Turkish subjects are immediately considered, and granted without much difficulty, as it was the case some short time ago, when more than 16 important concessions were granted, and some 20 more are on the eve of being sanctioned, but to Turkish subjects only, who will abide by the usuage of the country, and not allow themselves to be most disagreeable afterwards for unjust reasons, and to bring in claim after claim for damages.

The important concession granted lately to a native banker of this city, respecting the drying of the marshes in the province of Adana (Asia Minor), the embankment of the three rivers running through this province, and finally the harbour of Yemoustaklek, was coveted 10 years ago by a group of French capitalists, who, as a matter of course, supported by their Ambassador, completely failed to get hold of it; the Government preferring to give same to the native banker, who has formed already the company, interesting some French and English firms in the enterprise, among whom are the very parties who before solicited the same item through the influence of their Ambassador. This enterprise is one of the most important ever given out—most suitable for the State, and very profitable to those interested, who will derive therefrom an annual income of 500,000*l.* to 600,000*l.*, taking into consideration the hire of 200,000 hectares of very productive land, the dues from the navigation through the Canal, from Adana to Yemoustaklek Harbour, and those from the harbour itself—the only place of safety for ships along the whole coast of Syria. Thus Adana, one of the most important towns in Asia Minor, with its immense commerce—a natural consequence of its geographical position, which makes this town an intermediate station of commercial relations between Syria and Asia Minor—will take the rank of one of the most flourishing cities in the East, after the works referred to above will be completed; especially so when the concession of the great railway line of the Euphrates will be granted, making in that case of Adana the principal junction and "tête de ligne" of this important line to India. Other concessions, as said before, will shortly be granted, and we can assure you that, notwithstanding the assertions of the writer of the letter to which the present is a reply, capital will pour into this country if called for by native concessionaires, as every day financiers from Paris and London arrive here and try by all means to arrange matters with the owners of concessions, accepting almost any terms so as to find a good investment for their money, which they cannot find at present in Europe.

It is thus manifestly possible for the Turks to find means to work their concessions, and the offers made by foreign financiers to native enterprises prove exactly the contrary of what the writer above referred to was pleased to display; and it is a great mistake on his part to state that the Turkish Government has ever intended to work mines on its own account. This he knows as well as we do will not at all suit the Government, as the royalties paid compensate the Treasury amply for the administration without any outlay or expense. In conclusion, if the Goverment prefers its own subjects to foreigners why should our friend complain of it. Is it not quite right that the Government should promote the welfare of its own nation rather than fill the pockets of foreigners, who in all instances have proved to be inveterate enemies? MAHMOUD.

Constantinople, Nov. 1.

MINING PROGRESS IN BRAZIL.

SIR,—Since writing you last rains have fairly commenced, giving a fair supply of water for all mining purposes. At the Raposos Mines a new 12-stamp mill was ready for work on the 15th inst., and the excavation was being made for the third mill soon to be built. A new deep adit was also started at a point 130 ft. vertical below the present working adit. A large quantity of ore is already exposed, which gives in the mill from 3 to 7 oits. of gold per ton without assorting—that is to say the richer pay shoots give 7 oits., and the lode stuff intervening averages 3 oits. (1 oit. is equal to nearly 2½ dwts.) The Canal rich shoot or chimney is found to extend 38 ft. in the adit; it was but 16 ft. near the surface. There are also the Juca, Antimony, and Catica chimneys already cut, and beyond the forebreast yet to be opened are the Mina Grande, Cruz, Sarilha, and others.

It is generally conceded here that Raposos will make a history equal to that of the St. John del Rey, its near neighbour. Work in the mine is being pushed on as fast as possible, and while the syndicate, who have the work in hand, are fully satisfied that the future success is assured, a company will be formed for this property with the Repucha or Borges Mine and the Mines de Passagem. The Passagem Mines (same syndicate) have been worked in a rude way for more than 100 years. They were owned a few years ago by an English company, which, as is too often the case, was equipped with very costly management, Casa Grande, dress parade, superintendent, &c. There was no money even to provide a pump for the mine; all the water was worked out by hand, and no regular mining was carried on. Two years' diligent work proved that the mine is very extensive. A small mill (12 stamps) was put up, and 75 miners were employed to open reserves and to carry down the main shaft. There is now ore in sight (reserves) to supply double the present milling capacity for three years' time. The little mill pays all expenses and all prospecting work, and gives a profit of about 150*l.* per month. The mill was intended only to sample the ore, but by good management the result is as I state. The mill produce has steadily increased from about 75 ozs. of gold per month to 125 ozs., which is now the average yield. The property has a free water-power which works the pump, the cars, the forge, and the mill. The other property of the same syndicate, Repucha, or Borges Mine, has a 16 stamp mill nearly completed, new vertical working shaft, 7-in. pump, and complete hoisting gear. The mill will start on fine ore (worth 1½ oz. per ton) which is now exposed in the old shaft, in January next. From the Raposos 6 stamp sampling mill, and the Passagem mill were shipped in September 5 bars gold 950 fine, sold in Paris for 45,000 francs, and a shipment of 6 bars will be made in November.

When these properties are offered by formation of a company and issue of shares they will be worthy of attention. They have been examined by French and English engineers, and they are already proved to be extensive and rich. I look for a success equal to any gold mining undertaking ever offered to the public, as nearly three years' constant work, without stint of money, with the advice of good practical miners and eminent mining engineers, has been given to fully establish both the present and the future value of each mine. Ore has been sent to Europe for treatment, and very large results have been obtained, but all the profits have been made, and all the calculations are based on returns from these small mills without re-treatment of the tailings or the use of mercury. I have noticed this work frequently from time to time in my correspondence, and it has now assumed proportions and importance sufficient to justify all that I have said.

There is no move yet to re-commence work at the Dom Pedro Mine, Morro St. Anna, although it is said that an abundance of money had been subscribed in London for that purpose. In the prospectus, under the head of capital requirements, it is stated that it is estimated that the sum of 15,000*l.* will be required for re-opening the incline shafts and to sink 20 fathoms deeper. This sum is not sufficient to do the work. The mine timbers have gone to ruin, and the mine itself has closed up. That it is a good mine in the bottom I have no doubt, but I fear the calculation made by the promoters of the new company is too small. I am interested to promote the work of sound legitimate mining, and I think that 30,000*l.* is little enough for the work necessary to open and place the mine on a safe footing, without providing for payment of the debts and mortgage from the same sum.

At Morro Velho—nothing new in the St. John del Rey Mine. Cuiaba works on the same, no great loss monthly, but it is regular. The time has arrived when every unnecessary expense should be cut down, and this economy should begin in London where the managers have had a good thing for some time, and now that they are eating up the reserve fund shareholders and bondholders can well complain if the managers cannot work for nothing awhile. The 50,000*l.* bondholders felt more secure while a good reserve was in the treasury.

I hear of a powerful company about to take hold of old Morro St. Vincente, but I think, weak or powerful, any safe concern would first properly examine the property.

Brazilian Gold Mines.—You say—"basing their opinion on the information received from the manager, and from other available sources, express an undiminished confidence in the productive value of the mines." They are about to give the shareholders in the first instance a chance to put up more money and take 10 per cent. bonds. Where such available sources were found it is very difficult for one here to conjecture. The letters of Mr. Lott, the first manager of the works, to the directors should be published, and then some one (I do not recommend Mr. Lean) should examine the mine and property on behalf of the shareholders. So long as you wish me to inform the public in the columns of the *Mining Journal*, to the best of my ability, of the condition and prospects of the mines of Minas Geraes I shall speak of them as they are found here, and not as they are represented in London.—*Congonhas, Oct.* 25. MINAS.

AKANKOO, AND ITS MANAGEMENT.

SIR,—I observe in last week's *Mining Journal* that the question of dividends or no dividends this year is settled by the manager himself, who confirms Mr. Ross's statement that there would be no crushing this year; and, as to the panning, cradling, or puddling, no one ever gave a second thought to that; so that we still remain with 20 ft. of quartz and mullocky pay dirt, all showing gold freely in the pan, and with our present management and no dividends, and no likelihood of any.—*Nov.* 21. H. GETHING.

CORPORATION OF SOUTH AUSTRALIAN COPPER MINES.

SIR,—Judging from the little interest at present taken in this company I think my co-partners must be unaware of the present favourable position of the undertaking. I, therefore, solicit a small space for a brief *resumé* of the operations of the company. At the Blinman Mine at first much time was taken up in erecting new engines and the latest automatic dressing machinery. When this was finished and set to work the supply of water run short, and for a long time dressing operations could only be carried on during three days a week. It was then decided to endeavour to convey water from a well nearly a mile distant; but as iron pipes were to be obtained in the colony, and further delay occurred while they were being made, a portable engine now pumps the water from the well, forcing it at the same time through the pipes the above-mentioned distance to an elevation of 400 ft. on to the dressing-floors—a display of hydraulic engineering very creditable to Capt. W. T. Bryant, the manager of the mine. In the meantime the main shaft has been sunk, and the lode cut at the 70, and as levels are being driven at this depth, the lode is letting down more water, evidently showing that the water level of this part of the country has been reached. From the surface to the 50 fathom level the mine is quite dry. The lode is 15 ft. wide from the 50 to the 70 fathom level, yielding from 2 to 6 tons of 23 per cent. ore per fathom. The whole width of the lode can be taken away without timbering, the rock being sufficiently hard and strong to stand without any artificial support, thereby allowing the mine to be worked at a minimum cost. Judging from a section of the mine, which can be seen in the office of the company, it is not yet opened out in the deeper levels to anything like the extent of the upper levels, and yet Capt. Bryant calculates the reserves of ore in sight to be worth 50,500*l.*

The last report stated the output to be 100 tons of 23 per cent. ore per month, and that, in a week or ten days, would be able to work the dressing machinery 16 hours a day, in the place of eight hours as hitherto. This should enable the returns to be doubled at very little additional expense. The present profit on the ore is estimated at about 3*l.* per ton. To pay 5 per cent. on the capital of the company it would only require 6000*l.*, or a profit to be earned of 500*l.* a month. If the price of copper should advance in the new year, the receipts would be materially increased. The company are not dependent on one mine alone for its revenue, but are also developing a most promising property at Mount Rose. The ore raised being very rich, a stope in the bottom of the 23 fathom level is yielding 4 tons of 35 to 40 per cent. ore per fathom, worth 100*l.* per fathom. It is fully expected that after the next three months' working the output at both mines will be greatly increased. The foregoing interesting particulars shows at a glance the satisfactory position of the two mines.—*City, Nov.* 22. W. C.

INVOLUTION AND EVOLUTION AT SIGHT.

SIR,—At the Minneapolis meeting of the American Association for the Advancement of Science a paper of great practical value was read by Mr. O. S. WESTCOTT, of Chicago. It describes a method of obtaining squares and square roots almost by inspection; and since, beyond a brief notice of the paper in the Scientific American, I have seen no mention of it, I take the opportunity of bringing it to the notice of the readers of the *Mining Journal*. Although every schoolboy who has learned multiplication can readily obtain the square of a couple of figures, there are many who have long studied arithmetical processes who look upon the extraction of a square root as something excessively difficult. To ascertain that 729 is the square of 27 (because $27 \times 27 = 729$) is easy enough; but to determine at a glance whether 6241 is likely to be a perfect square, and if so what is the square root of the number would be regarded by many as something marvellous. Let us see why it can be done by the Westcott method, and then how it can be done. We will first make a little table:—

00	01	04	16	09
	21	24	36	29
25	41	44	56	49
	61	64	76	69
	81	84	96	89

It will be observed that the columns are quite symmetrical, and the figures can be easily impressed upon the memory if it be remarked that if the unit figure be 5 it must be preceded by 2; if it be 1, 4, or 9 it must be preceded by 0 or by an even number; and if it be 6 it must be preceded by an odd number; unless the two last figures be one of the pairs contained in the above table the whole number cannot be a perfect square. No perfect square ends with 2, 3, 7, or 8. It may be assumed that the student knows that two figures in the square gives one in the root, whence the rule for marking the square into two figure periods in evolution; so that 54,556 will be marked 5'45'56, which indicates that the root has three figures. For the present we will consider only numbers which yield two figure roots.

In considering the nature of squares Mr. Westcott discovered some hitherto undeveloped properties, and utilised his discovery in suggesting a very expeditious method of involution and evolution. He shows that the tens and units figures of all perfect squares of numbers from 26 to 49 inclusive are the same as the squares of numbers from 24 to 1 inclusive. Thus the square of 24 (*i.e.*, 25−1) is 576, and the square of 26 (*i.e.*, 25+1) is 676=difference 100. The square of 23 (*i.e.*, 25−2) is 529, and the square of 27 (*i.e.*, 25+2) is 729=difference 200. And so on until the square of 1 (*i.e.*, 25−24) is 1, and the square of 49 (*i.e.*, 25+24) is 2401=difference 2400. Hence the rule for obtaining the squares of any number between 25 and 50 is: Consider the excess above 25 as hundreds, and add the square of the difference between 50 and the given number. Thus to find the square of 47 we say 47 minus 25 is 22, which we call 2200, and 50 minus 47 is 3, and the square of 3 is 9; therefore the square of 47 is 2200+9=2209. Similarly to find the square of 38 we say 38−25=13 that is 1300, and 50−38=12, and the square of 12 is 144; therefore the square of 38 is 1300+144=1444. Mr. Westcott further observed that the tens and units figures of perfect squares of numbers from 51 to 99, both inclusive, are the same as the tens and units figures of the squares of numbers from 49 to 1 inclusive, and since 4 multiplied by any number of hundreds followed by 25, 50, or 75 (such as 150, 225, 375, and so on) gives an exact number of hundreds it follows that the tens and units figures of the squares of numbers less than 25 represent all the possible combinations of figures in those orders of units for all square numbers. The rule is thus varied when the number to be squared is between 50 and 100:—Take *twice* the excess above 50 and call it hundreds and add the square of the difference between 100 and the given number. Thus to find the square of 87 we say 87−50=37, and twice 37 is 74; that is 7400; then 100−87=13, and the square of 13 is 169, so that the square of 87 is 7400+169=7569. Further rules are given for higher numbers, but enough has been said to explain the principle; it may, however, be mentioned that the two next rules are:—For numbers between 100 and 200 take *four times* the excess above 100 and call it hundreds and add the square of the difference between 200 and the given number. For numbers between 125 and 250 take *half* the excess above 125 as *thousands* and add the square of the difference between 250 and the given number. It will be seen that the chief practical value of the method is for numbers under 100.

But it is with regard to the converse process—the extraction of the square root—that the method is of the greatest utility. Sup-

pose we require the square root of 1849 we see, considering in periods 18'49 as usual, that the root lies between 40 and 50, and as the tens and units figures indicate 7 we know the root must be 50−7=43. Suppose, again, we require the square root of 1521 we know that 15'21 must have a root between 30 and 40, and the tens and units figures indicate 11, so that 50−11=39 must be the root. Take a higher number, 7921 for example. Here 79'21 indicates a root between 80 and 90, and the tens and units figures indicate 11, so that 100−11=89 must be the root. When the root is nearer 50 than 100 it is easier to work from 50 with addition instead of working from 100 with subtraction. Let the square root of 3844 be required. Here 38'44 must have a root between 60 and 70, and the tens and units figures indicate 12; therefore, the root must be 50+12=62. The reason we can work both ways has already been explained; the tens and units figures indicate both 12 and 38 and 50+12=100−38=62. With comparatively little practice the root can be extracted almost mentally.—*Nov.* 20. ——— E. D. H.

COPPER AND TIN STANDARDS.

SIR,—Allow me to suggest that in publishing particulars of the Copper Ore Ticketings you should give as the standard the amount paid for 1 ton of fine copper in the ores, instead of the amount arrived at in the old-fashioned way. This latter is misleading and fallacious, being based on what is now an erroneous assumption; and as it is given as the standard for ore of the average produce of the sale only (each particular produce requiring a different standard), and as, of course, the average produce of the Ticketings vary, most people require to be told by an expert whether the average standard of any Ticketing implies a rise or drop. For example, the standard on Oct. 18 was 97*l.* 14*s.* for 6 produce. The standard on Nov. 1, 88*l.* 8*s.* for 7½ produce, meant a drop of 3*l.*; but the general public do not know why. Surely the standard ought to be simple, and clearly show of itself the rise or fall in copper. In theory the standard is the price at which fine metal in the ore is paid for. The tin standards are correctly so called; the produce of a parcel of tin ore is ascertained, 1½ in 20 (6¼ per cent.) deducted for returning charges, and the mine paid for the balance according to the standard of the day; but the copper standard does not occupy an analogous position. At the Ticketing the smelters hand in bids for the ores, which are sold to the highest bidders. The standard is worked out from the result of the sale of the several parcels of ore.

Take the figures of the Redruth Ticketing on Nov. 1, given in the Journal of Nov. 3, page 1265, and you have the items:—1. Ore, 1367 tons; 2, average produce, 7½; 3, fine copper, 101 tons 18 cwts.; 4, amount of sale, 5247*l.* 17*s.*; 5, price per ton of ore, 3*l.* 17*s.*; 6, price per unit, 10*s.* 3½*d.*; 7, price per ton of fine copper in the ore, 51*l.* 10*s.*; 8, average standard, 88*l.* 8*s.* Now, of what use is the last item, the average standard? What index does it afford to the actual value of fine copper? The fallacy lies in the use of 2*l.* 15*s.* per ton as assumed returning charges in working out the standard. The employment of this 2*l.* 15*s.* implies that the fine copper in 1 ton of ore is worth the price paid for that ton of ore by the smelters plus 2*l.* 15*s.* Now, 1 ton of 7½ produce ore as above brought 3*l.* 17*s.*; this, added to 2*l.* 15*s.*, gives 6*l.* 12*s.* as the value of the fine copper in that ton of ore, which makes 88*l.* the standard or value of 1 ton of fine copper; but fine copper was not worth 88*l.* on Nov. 1, nor do the smelters charge 2*l.* 15*s.* for returning 1 ton of ore; hence the so-called average standard is unreal—a delusion if not a snare.

Your table should end with item 7, as above; this, if correctly worked out, gives the true standard—the price per ton at which the fine copper in the ore was sold. But the 1367 tons (1) are 21 cwts., equal to 1435 statute tons 7 cwts.; the fine copper (3) should be 107 tons; price per unit (6), 9*s.* 9¾*d.*; and the price per ton of fine copper in the ore (7), 49*l.* 1*s.* The market value of 1 ton of fine copper was (say) 65*l.* 10*s.*, leaving a margin of 16*l.* 9*s.* for the smelters' charges; and as at an average produce of 7½ it takes 13⅓ tons of ore to yield 1 ton of fine copper, this makes the returning charges at that Ticketing 1*l.* 4*s.* 8*d.* per ton of ore. The use of the old Cornish copper standard involves a lot of unnecessary calculations, especially in the making up of tributers' accounts. It may once have been necessary, but that it serves any real purpose now is greatly doubted by—

Truro, Nov. 15. ——— WM. HOWARD WATSON.

HALF-FORMED PUBLIC COMPANIES.

SIR,—About a year ago I was favoured through some London office with a prospectus of a mining company, to be called the ——— (Limited); and all looking so brilliant I was induced to apply for a number of shares, and upon which I paid the deposit as requested in the prospectus. Through the bank I got a receipt for this. No further calls have ever been made, and although I have frequently written to the office of the company, no reply has been vouched to me; and I have requested my deposit money to be returned, as from acquired experience during the year I have lost faith in the company. I asked for 25 shares, and thought my investment would increase. I much doubt that all is lost. How many other poor men may be even worse off than myself? If this meets the eye of any such let them obtain the Articles of Association of any company, and see the class of persons who form the directorate, and what is the amount of cash interest they place in the concern. I believe that one share each is the extent of their liability; but they form the control of the board, and we holding any number of shares below 100 have not even a vote or claim for any reports of proceedings or balance-sheets. There is something far from right.

Durham, Nov. 12. ——— KOHLENSAURE.

RELATIVE EFFICIENCY OF ROCK-DRILLS.

SIR,—In our note in last week's *Mining Journal* we should have further stated that the general average pressure of the air for working the boring machines in the advanced headings of the St. Gothard Tunnel, as shown by the official monthly reports, was 3·64 atmospheres to the Ferroux machines at the north side, while it was only 2·85 atmospheres to our machines at the south side.

Delahay-street, S.W., Nov. 22. MACKEAN AND CO.

GENESIS OF METALLIFEROUS VEINS.

SIR,—In the *Mining Journal* of Aug. 4 I observe you give extracts from Prof. Joseph Le Conte's (University of California) paper "On the Genesis of Metalliferous Veins," and I observe therein stated that—"The question is now settled for ever that metalliferous veins are deposited from liquid forms. He is satisfied that the old theory of sublimation must now be abandoned, and minutely described the process of deposit from solution constantly going on at Sulphur Banks through the agency of up-coming solfataric waters. . . . The structure, mode of occurrence, and contents of these veins no longer leave any room to doubt that they have been formed by deposit from solution. . . . He spoke of gold veins as the most difficult to account for, but explained clearly their methods of deposit in full accord with the rules here laid down. In solfataric springs he claims that Nature's process of vein deposits is clearly revealed, and their study is invaluable."

Now, Sir, I venture to think that the question is not settled for ever that metalliferous veins are deposited from solution, or at any rate a great many hundreds that I have carefully examined in Australia during the past 24 years, could not I believe have been so formed. As for the old theory of sublimation no doubt it must be abandoned, but I thought it had been by all thoughtful and observant men long ago. I do not mean to say that the veins at Sulphur Banks are not formed by deposit from solution; very likely they may have been, and possibly many others elsewhere, but I do think that there are vast numbers of metalliferous veins that are not formed by deposits from solution in the manner described. As the Professor speaks of gold veins being the most difficult to account for, perhaps he and many of your readers interested in gold mines would like to hear the views I entertain of their formation, after very extended study of them in Nature's great workshop underground. I present them with my views, not thinking that I have solved this great problem, but that I may have approached near to so doing, and possibly may aid some other observer so to do.

I should mention that the following remarks are taken from a paper I read before the Royal Society in Melbourne in 1881, "On the Origin of Gold and of Quartz Reefs." This paper was so fully published by the gold fields papers in Victoria and two or three of the colonies at the time, that a rule of the society was considered to have been broken, and consequently the paper has not been published in its Transactions, and therefore its contents are not recorded in the usual manner, and only known locally.

Melbourne, Oct. 9. ——— WILLIAM NICHOLAS, F.G.S.

SUEZ CANAL.

SIR,—Far be it from me to give vent to a word that might injure the feelings of our distinguished guest, Mr. de Lesseps, but is he not assuming too much when he states to our merchants and shipowners that he and his company are "now ready to start the construction of this second canal"? Unless the Egyptian Government is a mere tool in that gentleman's hands would it not be well to first of all obtain from them the requisite permission to construct one before going so far, and should he gain that permission he has yet another far more serious impediment to his wishes in this direction—the sanction of England to the scheme. It is all very well for a section of the English Press to be for ever prominently setting forth in eulogistic terms the claims of Mr. de Lesseps to the exclusive right of the waterway of the isthmus, but I am under the impression that he will soon get his mind disabused of such a monstrous and preposterous idea.

It appears that the fact of our not supporting the construction of the first canal is a favourite theme of Mr. de Lesseps, and before an English audience he waxes pathetic on it. I hope it is not lost upon his hearers, as Englishmen under such circumstances have "very little poetry in their soul." I would ask that gentleman what would have become of the canal ere this, if we had refused supporting it with our custom? Why, the "small people" now would be imperceptible, and doubtless few traces of the canal left in the sand beyond the station-houses, which the Arabs might inhabit. Admitting Mr. de Lesseps's great engineering faculty the fact of the matter is we have hitherto made too much of this little Frenchman. We are most certainly to blame in the matter as we have materially assisted him in the belief that he is a little despot over the isthmus, and it is now our plain duty to acquaint him in as delicate a manner as possible that he is nothing more than an ordinary individual—a manager of a canal company.

It is understood in Cairo that the Egyptian Government's legal advisers entertain an opinion directly opposed to the claims advanced by Mr. de Lesseps, that the company have a right to construct a second canal or even widen the existing one. Before further treating with Mr. de Lesseps on the subject would it not be well for us to ascertain the correctness of his assumption, otherwise matters may get disagreeably mixed. In the meantime whatever place he honours in England with his presence, by way of a welcome let the bands give him the "Marseillaise" to his heart's content, but upon business matters let him descend from the position we have unfortunately helped him to assume.

It must be perfectly understood that England is the conductor in this Suez canal business—the Egyptian Government the first fiddle, and Mr. de Lesseps the second fiddle, or any other instrument his fastidious taste may aspire to, other than the ones named.

Perranporth, Nov. 20. ——— W. NINESS.

ECTON COPPER MINES.

SIR,—It was with more than ordinary interest I perused "A. R. S. M.'s" article in the *Mining Journal* of Nov. 10, relative to the antiquity of these mines. I can confirm his statement that marks of the German boring augers may still be seen in the Dutchman's Level. When a lad, with others, I have often been run up and down in a wagon on the tramway in that level, in the days when the late Captain Bonsall held the Ecton sett. Captain Bonsall was highly respected by a large circle of friends, and his demise was greatly lamented by all who knew him. For many years he worked the portions of the sett respectively known as the Back of Ecton and Good Hope, from whence large quantities of lead ore was raised. It was always that gentleman's opinion and many others, that if a company could be formed strong enough to re-work old Ecton mines there was every likelihood of its history repeating itself. In the neighbourhood of the mine tradition says that Prince Rupert himself first discovered the copper when riding through that portion of the country with some of his followers, his horse picked up a stone, the peculiar colour of which attracted his attention. Upon examination it was found to be copper. Whether Prince Rupert personally did discover the mine or not is a matter of question, but I think there is sufficient evidence to prove that he sent over German miners to work it.

The prospectus of the Ecton Company which has appeared in the *Mining Journal* is anything but overdrawn. I consider the prospects of the mine being again remunerative are indisputable. Even in the face of the immense returns from Devon Great Consols, I may say the Ecton Mines have been the richest copper mines in the United Kingdom, both in quantity of ore raised and quality. The principal owner of the mines, his Grace the Duke of Devonshire, worked them in their prosperous days, and if that gentleman's exchequer had not been full to over-flowing point, doubtless the mines would have continued working to the present period. The bulk of the copper has so far been raised from a pipe vein, its gangue being a congenial limestone. As a proof of the immensity of the carbonas of copper in the vein, there is one point, called the Great Opening, where if a good stone-thrower was to stand in its centre it would be impossible for him to hit the sides or roof of this artificial cavern with a stone, the distance being too great. Doubtless there are still one or two of the old miners living in the district who have attempted this feat. The water in the old mine is unusually light for the depth and quantity of ground opened up, as I believe a 4 in. or 5 in. pump is sufficient to cope with it at any time. Its situation for natural advantages is unique.

It is not generally known that there are copper mines in Derbyshire, that country being noted for the most ancient lead mines, and the Ecton Mines can be said to be only just in Derbyshire, as the boundary with Staffordshire is that of the sett. The most important part of the mine yet discovered is on one side of the most picturesque valley in England. About 2 miles down the valley from the mine is the famous Thor's Cave, wherein it is supposed the God Thor was worshiped by the Saxons, and about which the scenery is magnificent. Several years ago Mr. Bateman (late of Lomberdale House, Derbyshire), whose valuable collection of antiquities is now in Weston Park Museum, Sheffield, and the late Mr. Carrington (Welton) two well known antiquarians, excavated Thor's cave and found several exceedingly interesting Roman relics. W. NINESS.

Perranporth, Nov. 14. ———

THE ECTON COPPER MINES.

SIR,—I have read with much interest the letter in last week's Journal from your correspondent, Mr. G. Atwood. If he should feel inclined to visit the scene of former labours he would find a welcome from at least one man who remembers his location here prior to 1840. The present company is not yet doing much in the Old Ecton Mine (simply proving one or two cross-courses at adit and Salt's levels), intending to develope this part of the estate from East Ecton shaft, which is being carried down about twice the diameter of the Old Ecton shaft to accommodate modern winding and pumping appliances. This shaft is 500 yards east from Ecton engine-shaft, and is sunk upon a strong vein underlaying north, and becoming more vertical in depth. The lode is freely spotted with crystals of yellow copper at 20 fms. below surface.

Clayton shaft is the centre of present operations, and being a better shaft than any other in the two royalties (although not so deep by 20 fathoms as Ecton) is being equipped with the best modern appliances). Clayton deep adit is being extended into the Duke's royalty east upon a strong crystalline vein (stained with copper carbonate in patches) nearly parallel with Ecton vein, and 320 yards south thereof from the same adit. Vivian's level is also being driven north-west upon what appears likely to prove the richest ground in the estate. This vein contains yellow, brown, and green copper, which is daily increasing in quantity; the ore is all covered with red iron carbonate, but has just passed through a small cross-course of dense yellow ore, with black oxides on each side of it, cutting completely through the vein and standing in the south limestone vein about 1 inch wide. All this ground is much to the west of any previous copper deposit that has been found in either royalty. Ecton vein is also being driven west at Salt's level, to intersect Ider Alley cross-course. An old miner says the small vein crossed in Vivian level carries exactly the same sort of ore as Ider Alley in Old Ecton deep workings, and that the south wall in Vivian's level is exactly similar rock.

The most important workings in the southern part of the Blackett royalty are in connection with the Water Bank Mine; these have produced good copper ores down to 45 fms. below surface. It will take about 12 months to connect this mine with Clayton adit, which is 30 fms. below and 50 fms. west. The present company having concurrent leases of both royalties, and all the working arrangements having been fully approved by the lessors, progress will be greatly facilitated, and there are fair prospects of profitable results at a very early date. JOSEPH BERRISFORD, Mineral Agent.

Devonshire Estate Office, Ecton Mines, Nov. 21.

GREAT AND IMPORTANT DISCOVERY OF SLATE AND SILVER-LEAD IN MERIONETHSHIRE.

SIR,—A discovery of great importance has during the past fortnight been made on a mineral property called Hafody-y-Spytty and Gamallt, situated near Festiniog. Being in that locality a few days after the discovery was made, and being interested in mines and quarries, I availed myself of the opportunity of visiting this property, and from what I saw, and was pointed out to me by the owners' engineer, Mr. George Spargo, who I was fortunate in falling in with, I satisfied myself that a greater discovery has not been made in either North or South Wales (both of which I am a speculator in), and from all I have seen I fearlessly say that if this property is developed in the manner pointed out to me by the engineer the Hafody-Spytty and Gamallt property will speedily become one of the richest mining and quarry properties in the Principality. It is a well-known fact that the principal quarries in the immediate vicinity are getting deep and expensive to develope, therefore this mineral property may be looked upon as being a new era in the Festiniog slate district. The slate-rock can be plainly seen cropping out to surface, and proved by trials made in different places, hence there is but a trifling overburden to remove the advantage connected in developing the property is unusual, having ample water supply from three lakes situated at the summit of the property, and over 50 acres in extent; and with a very small outlay six times the quantity can be commanded, with plenty of fall to work water machinery of any dimensions. The Great Western Railway from Festiniog to Blaenau Festiniog passes within 800 yards of the lower boundary of the estate, which is about 500 acres in extent, and can be reached directly from the workings by self-acting incline tramways, thus the transit of produce is reduced to a minimum.

But the great discovery to which I must allude to is the discovery of a large or giant silver-lead lode, which is already cross-cut into for upwards of 30 ft. (and the footwall not yet seen), producing rocks of solid silver-lead upwards of 56 in., in a rock with a run of solid lead, as nearly as I can judge, 20 in. wide. This lode can be seen for upwards of half-a-mile in length, yielding large rocks of ore every place cut into, and such as the Great Van Mine could not excel even at its richest point. This lode can be seen just below the lakes 200 or 300 yards in a westerly direction, and I think it is only a meed of justice on my part to thank the engineer for his kind attention and information rendered to me, and to congratulate the owner, as a mining and quarry speculator, on the important discovery made, and at the same time to advise capitalists not to lose sight of such a valuable property, but to go and see for themselves, as the greatest tyro would at once be convinced as to the intrinsic value of this property when developed, and all that appears now to be required is plant to make the produce marketable, and although lead and slate are at a low ebb at present yet this property evidently will pay well for working, and should a large company or a small syndicate company be formed to obtain the means required in getting the necessary plant, &c., I am confident of the great success that must accrue.

Madryn, Nov. 20. ——— W. W. W.

NORTH TRESKERBY MINE.

SIR,—The name of this mine indicates its situation. It is really north of the old mine called Treskerby, which is situate in Gwennap, and contiguous to Scorrier. Treskerby and Wheal Chance ceased to work in 1828, after having yielded large profits to Messrs. Williams and Co. It is said that a sum of 200,000*l.* or more was divided between the shareholders. North Downs, which adjoins Treskerby on the north, also yielded very large dividends of profit. North Downs adjoins North Treskerby on the western side, and some of the lodes of the former pass through the latter mine; but, independently of such lodes, North Treskerby has lodes numerous. This mine was set to work in the year 1859. I see from my survey of 1865 that at that time the number of shares was 5936, that the late Mr. B. Matthews was the purser, and Capt. Richard Pryor manager, and that in 1864 the sales of copper and tin realised 10,387*l.* 6*s.* 8*d.* Large profits at one time was made out of the working; but owing to the insufficiency of pumping power, the rich deposit of copper ore, pursued to the eastern side of the sett, the work was, *pro tem.*, suspended there, and application was made to the lords for an extension of the eastern limit. New leases were obtained at 1-24th dues; the dues under the first lease were 1-18th. The new lease embraces a portion of the mine called Scorrier Consols, which was slightly worked a few years ago.

The mineral owners are—of tin, Duke of Cornwall, a moiety, and the lords of Tywarnhaile, Tyas, the other moiety; of copper, Sir William Williams, Bart., and others. The land is called Goonearl Manor, and is in St. Agnes parish. After the new lease was obtained the company erected an 80-inch cylinder engine in the eastern part of the mine to drain the water, so as to develope the copper ore underneath, and to command the water in Scorrier Consols. The resources of the company having failed, their affairs were liquidated in the Stannary Court, and Capt. Richard Pryor purchased all the plant and leases for some gentlemen in London, who are now working. Since they took possession of the property the deep adit—the great adit of the district, called Gwennap adit—has been extended northwards 110 fms. The previous workers had driven it 90 fms.; in prosecuting this adit two tin lodes have been intersected, the quality of which has enhanced the value of the mine considerably. No. 1 lode, so called, is worth 17*l.* per fathom, and No. 2 lode is worth 22*l.* per fathom.

The tinstone, containing as it does a high percentage of black tin, is being placed under a wooden shed, because it is too rich to lie exposed. A large heap (several hundred of pounds' worth) is now accumulated there waiting for reduction. Stamping machinery will, I believe, be supplied shortly, and also the usual appliances for dressing the tin for market. North of the two lodes (Nos. 1 and 2) there are four or five other lodes, which it is proposed to intersect by a further extension of the deep adit; this adit is about 50 fms. deep; it is an important tunnel in the district, and should be taken advantage of for the discovery of lodes in many places by its prosecution. The aggregate length of this adit, which commences near Bissoe, is about 33 miles. The lodes (1 and 2) are entirely undeveloped above and below the adit, from which fact I infer that, omitting from calculation all other lodes, the proprietors have first-class prospects; but from rich tinstones found in the lodes further north I anticipate additional valuable returns.

The copper lode, on which the 80-inch engine is placed, was struck by the engine-shaft, I believe, near the adit, and the shaft has been sunk on it to a point below the 40 fm. level, and about 40 fms. further sinking it will reach the rich deposit of copper ore deserted by the late company owing to the overpowering water. The pumping-engine is about to be restarted, and the sinking of the engine-shaft will be resumed by the rock-drill, which is on the ground. A winding-engine and steam capstan are to be erected forthwith. The out look of the owners is highly encouraging. The manager and purser is Capt. Richard Pryor, of Redruth, who, from the perfect confidence entertained in the success of the undertaking, has laboured hard to promote it. Judging from the circumstances success seems assured.

Truro, N v 20 R. SYMONS.

THE ORIGIN OF GOLD AND QUARTZ REEFS—No. I.

By Mr.] WILLIAM NICHOLAS, F.G.S., Geological Lecturer at the Melbourne University and at the Sandhurst School of Mines.*

Before entering into the consideration of the details of the subject of this paper, I desire to make a few preliminary remarks. Quartz mining in Victoria has now been carried on during a period of about 25 years, numerous theories respecting the origin and modes of occurrence of quartz reef and of gold have been from time to time submitted to the public. I shall not occupy your time in recapitulating any of the theories, but will simply mention that I think there has been too much attention bestowed on theorising in the study and arm chair, and too little given to the observation of Nature and to the recording of important facts which have been developed broadcast by the miners' operations in the mines. Believing this to be the case, I have for many years set myself to gathering such facts as I conceived would aid the miner and the scientific man in his study or laboratory. I have taken up this line of observation because I feel assured that if mining managers, miners, and others who are practically associated with mining will also note and publish the facts which are daily being developed in the particular reefs within their range of observation, we shall quickly have gathered much valuable information that must be of great service to the mining industry, and that will limit the field of theory within reasonable bounds. Such facts as I shall place before you have been collected from actual observations in quartz mines; my remarks and experiments are founded on those observations, and I venture to hope they will prove to possess some practical value. I may say I did not purpose reading this paper until I had accumulated more information; but as my notes, &c., may be of assistance to other observers, and may also be the means of enlisting additional labourers in the same sphere of work, I have now decided to give such of my notes and experiments as I conceive will be useful, and will supplement them at a future date.

In undertaking such a difficult task as the removal of the thick veil of mystery which has enveloped the origin and growth of quartz veins and of gold, the observer should be influenced as little as possible by preconceived theories or ideas, so that his mind may be open for the reception of ideas that commend themselves to his judgment, and his eyes open for the observation of facts that may destroy or support them. To a certain extent the observer must content himself with being mechanical, and note occurences which may possibly be important, although he cannot at the time comprehend what relevancy they have to the subject of his investigation. Reason must be partly dormant until a favourable concatenation of circumstances force it into activity. Under such impressions as those mentioned I have worked. Numerous facts in the study of quartz veins must, in the present state of our knowledge, simply be accepted as such, without our understanding the why or wherefore. For example, that auriferous and non-auriferous quartz reefs exist in certain belt of rocks, which are to all appearances of an identical character, that certain parts of a quartz reef are poor—which possess more or equally favourable appearances to those parts that are rich in gold; that within auriferous belts of country there are very poor as well as very rich quartz veins. No reasonable man will, however, doubt that such phenomena are capable of explanation, and that they carry with them, or contain their own history, which simply require intelligent and patient observation, and the addition of fact to fact—properly classified—to be eventually read and understood. We cannot rest satisfied in this progressive age with the "where it is, there it is" of the ancient miners, and we must find out "why it is, and why it is not." No thoughtful man thinks that any of Nature's operations are the effect of chance. He believes they are guided by natural laws. The more closely Nature is studied, the more decidedly is it proved that to assign the works of Nature to chance or accident is only to confess our own ignorance of cause and effect. We now know that law and order prevail throughout Nature on the surface of this earth, and in the movements and structure of the various systems of planets and stars that surround it. Then why should disorder, chances and, accident reign below the surface, where comparatively stupendous systems of veins ramify the older rocks of the earth's crusts.

I believe that the Silurian strata in Victoria, from the time of their deposit as sedimentary rocks contained the germs and necessary materials for the birth and growth of quartz reefs, whenever the circumstances, or the altered position of the strata, and the changes contingent on the passage of time were suitable. This time arrived when the Lower Silurian began to be corrugated. For it is impossible to bend or corrugate solid horizontal strata, such as sandstone and slate, without those strata slipping over each other in the lines of least adhesion. Those lines of least adhesion in the strata were undoubtedly, for the most part, between the beds of slate and sandstone, or within the slates where the bedding planes are well defined. We know the strata were originally deposited, and are now of unequal thickness, therefore, the lines of space were forming when corrugation and sliding were taking place. In those situations where the strata were very adhesive, and not pliant, and corrugations still steadily, but very slowly, progressed, fracture lines crossed the strata at points where the strain was greatest, or the resistance was least. The most favourable points for such fracture lines would be in anticlinals especially; and also in synclinals. Now in these sliding lines, or in the fracture lines, however fine they might be, would lodge water, and that water would naturally originate a system of circulation, and that circulation originate quartz reefs. The mineral waters thus accumulated and accumulating in the slow progress of corrugation were at work decomposing the slates and sandstone, in or between which they had gathered, and changing especially the slate into quartz reefs and veins. I do not think it necessary, nor do I think it possible, that these sliding or fracture lines should open, or did open, so as to provide our reefs or veins with space in which to form. Then too, it has been very generally presumed that all laminated lodes or veins have been formed by successive openings of veins or lodes, and that too as a rule very conveniently in their central lines.

At times, however, if the circumstances seem to require a different explanation, one of the side laminations is supposed to have opened. But perhaps I had better quote from Von Cotta's "Treatise on Ore Deposits," where at page 10, under a chapter headed "The Texture of the Ores and Vein Stones," occurs the following remarks:—"5. Combed or Banded: The separate ingredients or combinations of two or three of them form layers of equal or unequal thickness." "This variety of texture is particularly common in metallic veins, the layers are then parallel to the fissure; the first or oldest comb (*a*) was deposited on both sides of the clefts, on the second (*b*), and so on (*c*, *d*), until the whole fissure was filled. In this manner the same, or at least very similar bands are symmetrically deposited from the sides to the middle." Now, to a miner or anyone acquainted with the devices which men are obliged to adopt so as to keep the walls of a reef open, and who are well aware that in the majority of cases in Victoria filling or "mullocking-up" must keep pace with stoping on the excavation of the reef; such successive openings of quartz reefs are, at any rate, impossible at the present day. It must not be forgotten either that our reefs extend frequently ¼ mile or more in length, and this theory requires fissures or clefts in the rocks of such great lengths and proportionate depths to be kept open for indefinite periods, whilst the veins are growing on each wall to fill them up. Then, too, we must acknowledge that these said open fissures were necessarily filled with water or gases, either of which would assist in the destruction and collapse of the wall rocks of these fissures.

As I just now observed, it is impossible to keep open such immense fissures in the strata—through which our quartz reefs run—at the present time. And we have no reason for assuming that these strata are less firm or hard than at any time in the past. On the contrary, we have good reason for believing they are now more indurated than they were. But if we grant the strata now to be equally hard to what they were in the past, then we have an insuperable reason why our quartz reefs could not have been formed in accordance with the open fissure theory. By this theory, too, you will have noticed that the "oldest" bands are against the walls, and that in the centre are the most recently formed. Now, I believe on the contrary, that the centre bands are the oldest, and the bands next the walls the youngest; my opinion is that our quartz reefs grew in width and length by small successive enclosures of part of the boundary wall rocks, and in width especially on the footwalls. This is the general rule, although some of the enclosures are very large. The manner in which the reefs grew, judging from their structure, and from an extended study of them *in situ*, must have been somewhat in this fashion—Water under pressure softened and saturated the rocks, insinuated itself along the bedding and the cleavage plains, and frequently crossed them obliquely in soft weak places. The change from slate to quartz, or clayey sandstone to quartz, followed more or less quickly on the advance of the water, according to the varying nature of the rocks, sometimes tiny veins of calcite preceded the quartz.

* "The Origin and Growth of Gold and Quartz Reefs or Veins in the Lower Silurian Rocks of Victoria," being a paper read at the meeting of the Royal Society in Melbourne on Aug. 14.

ELECTRIC PULVERISER AND AMALGAMATOR.

In mining for the precious metals the product obtained has, it is true, a permanent and intrinsic value. Yet experience has shown but too clearly that the resulting profits are frequently smaller than from other branches of mining, and it is generally considered that this is owing to the inefficient manipulation of the mineral. Taking this view, Mr. JAMES MANES, of Morrison, Colorado, has designed an electro pulveriser and amalgamating machine for saving the rusty and fine gold, also the quicksilver, that has been lost in hydraulic washing for gold on the coast of California ever since the commencement of hydraulic washing in the summer of 1852. It is said that the loss has been at the rate of from 20 to 35 per cent. of the precious metals and mercury, which, if saved, would amount to hundreds of millions of dollars. Notwithstanding all the modern improvements in mining machinery, immense quantities of the precious metals are constantly washed away and irrecoverably lost. The value of this lost portion, according to various estimates, is very nearly, if not quite, as great as that of the metal secured. A great deal of engineering skill and inventive genius have been engaged in trying to devise means of preventing this great loss. This has generally resulted in placing various devices in the sluices to catch and retain the stray particles of gold or sulphuret. Some of these inventions have been more or less successful, but none of them have saved anything like a reasonable proportion of the valuable part of the metals.

The electro-amalgamator, it is claimed, will save from 50 to 75 per cent. of all the gold and quicksilver that passes through the machine, as the rusty gold will be perfectly scoured and electroplated with quicksilver, and thoroughly amalgamated by the rapid action of the electrical steel brushes and steel mullers that revolve inside of the series of steel cylinders in the machine, placed one above the other, and made cone shape, and connected with spouts; the large end of one cylinder is placed under the bottom of the small end of the next one, and so on, forming inclined planes for the sand or crushed ore to run down by its own gravity, which is assisted by streams of water and quicksilver, constantly fed into the machine from a hopper on the upper part of the machine; and the powerful current of electricity is constantly passing through the sands or ore, as it passes from one cylinder to another, and as it is thoroughly mixed at the same time with the quicksilver by the steel brushes, no gold escapes without having been thoroughly amalgamated. The material passes through a moveable iron spout into settling tanks, where the cleaning up is done. The machine does not stop except when repairs are needed; the waste water of the sluice boxes is used for driving the machines, and but one man is required to attend to each machine. The fine sands will be conveyed into the machines through screens of the proper size. This apparatus can be used in stamp mills for amalgamating purposes, and will surpass the old process of treating gold and silver ores.

NEW ORE ROASTING AND CHLORIDISING FURNACE.

A patent for a new style of furnace has been obtained by Mr. ROBERT A. NEVIN, of San Francisco, California, and since July, 1882, it has been in successful practical operation, so that some opinion may be formed of its merits. It is an improved roasting and chloridising furnace, designed to work low grade refractory ores of gold and silver quickly and cheaply, with no waste of salt or loss of precious metals. One of these furnaces is running at the Navajo Independence Mill, Tuscarora, Nevada; and with regard to it the superintendent says that the improvements made in the manner of desulphurising and chloridising have added 4 per cent. to the working results, and a saving of 25 per cent. in salt. The workings have averaged 94 per cent. since this furnace was put in use. The shipments of bullion (960 to 970 fine) from the mill have been steady, showing results of the most satisfactory kind. They have shipped since they begun working with this furnace some $700,000 up to May 2; capacity of mill, 10 stamps. Arrangements are now being perfected to put these furnaces in operation at other mines on the Pacific Coast, to take the place of those styles which have failed to accomplish such high results.

The cylinders are encircled by bearing-rings, which rest on friction-rolls. These are suitably journaled in boxes that are fixed on a bed. These cylinders or furnaces are set at an inclination of an inch to the foot, or thereabout, and are designed to be revolved by means of worm and wheels, or other suitable device. The two furnaces are set at different elevations, the first furnace having its higher and receiving end revolving in a flue that is connected directly with the smoke stack, while its lower end revolves in the fire-box. Extending laterally from the fire-box is a flue that extends parallel with a second flue for a short distance, and then turns at right angles and enters the smoke stack. The higher or receiving end of the furnace or cylinder revolves in the first flue on a lower plane than is the fire-box, and the lower end of said furnace is supported in a fire-box on friction-rolls, or other suitable device.

When the device is in operation the ore to be treated is fed into the higher end of the first furnace, through a hopper, and passing through the furnace is exposed to a gradually increasing temperature as it approaches the fire-box, whereby the ore is wholly or partly desulphurised, the sulphurous fumes passing off at the same time through the second flue directly into the smoke stack. From the lower end of the first furnace the desulphurised ore falls through an inclined passage or chute in the first flue into the higher end of the second furnace, and as the desulphurised ore passes through said passage or chute common salt is introduced through a hopper to mix with the ore and fall with it into the second furnace. The mingled ore and salt then gradually descend through the second furnace, exposed to a gradually increasing temperature as they approach the fire-box, whereby the metallic portions of the ore are chloridised, until the ore finally falls into a suitable receptacle, whence it may be removed for lixiviation or amalgamation.

In this operation, the ore being wholly or partially desulphurised or oxidised before the application of the salt, the metallic portions of the ore and the chlorine of the salt more readily and thoroughly combine, thereby effecting a saving of salt and of the metals over the ordinary methods, and the passage of the ore from one furnace to the other being continuous, the ore does not become cooled in the operation. It is claimed that the principle on which the furnace does the work so effectually and quickly is based on the old and approved method of oxidising or desulphurising before chloridising. There are two flues, a construction which admits of driving off the fumes while the ore is being desulphurised, but the chlorine of the salt is retained in the chloridising furnace.

With regard to the working results it is stated that at the mill in Tuscarora, Nevada, where the ore from the Independence and Navajo Mines is worked, some good work was done during the past year considering the class of ore. They dry, crush and roast with chloridising furnaces, on the Nevin combination plan. The superintendent of the Navajo in his annual report (Aug. 1) says:—The mill run covers a period of 321 days, of which the actual running time was 309½ days; showing a loss of 11½ days, including all stoppages. Milled 3955 3-5 tons of Navajo ore, and 282½ tons of custom ore, making an average crushing of 13⅔ tons of ore per diem. The ore from the Navajo Mine was worked to 92 3-5 per cent. of the battery assay. Shipped bullion on customers' account to the amount of $64,863·42. On Navajo account, to the Bank of California, from Navajo ore, $730,379·38; from custom ore, $21,549·37; from profits on custom ore, $2,206·58, making a total production in bullion of $818,898·75 (assay value) from July 21, 1882, to June 7, 1883; of which amount 729,874·58 was shipped during the fiscal year on company account. The quantity of ore crushed for a battery of 10 stamps, and the percentage to which it was worked, has been unusually satisfactory. The condition of the mill for the last half of the run added materially to the cost of reduction, and the repairs required on the engine necessitated a suspension of work for a considerable length of time." The report of the superintendent of the Independence is equally favourable. The furnace has good promise of coming largely into use.

THE NEW PATENT, DESIGNS, AND TRADE MARKS ACT.—No. VI.

PART IV.—TRADE MARKS.—REGISTRATION OF TRADE MARKS.

62.—(1) The comptroller may, on application by or on behalf of any person claiming to be the proprietor of a trade mark, register the trade mark. (2) The application must be made in the form set forth in the First Schedule to this Act, or in such other form as may be from time to time prescribed, and must be left at, or sent by post to, the Patent Office in the prescribed manner. (3) The application must be accompanied by the prescribed number of representations of the trade mark, and must state the particular goods or classes of goods in connection with which the applicant desires the trade mark to be registered. (4) The comptroller may, if he thinks fit, refuse to register a trade mark, but any such refusal shall be subject to appeal to the Board of Trade, who shall, if required, hear the applicant and the comptroller, and may make an order determining whether, and subject to what conditions, if any, registration is to be permitted. (5) The Board of Trade may, however, if it appears expedient, refer the appeal to the Court; and in that event the Court shall have jurisdiction to hear and determine the appeal and may make such order as aforesaid.

63.—Where registration of a trade mark has not been or shall not be completed within twelve months from the date of the application, by reason of default on the part of the applicant, the application shall be deemed to be abandoned.

64.—(1) For the purposes of this Act, a trade mark must consist of or contain at least one of the following essential particulars:—(*a*) A name of an individual or firm printed, impressed, or woven in some particular and distinctive manner; or (*b*) A written signature or copy of a written signature of the individual or firm applying for registration thereof as a trade mark; or (*c*) A distinctive device, mark, brand, heading, label, ticket, or fancy word or words not in common use. (2) There may be added to any one or more of these particulars any letters, words, or figures, or combination of letters, words, or figures, or of any of them. (3) Provided that any special and distinctive word or words, letter, figure, or combination of letters or figures, or of letters and figures used as a trade mark before the thirteenth day of August one thousand eight hundred and seventy-five may be registered as a trade mark under this part of this Act.

65.—A trade mark must be registered for particular goods or classes of goods.

66.—When a person claiming to be the proprietor of several trade marks which, while resembling each other in the material particulars thereof, yet differ in respect of (*a*) the statement of the goods for which they are respectively used or proposed to be used, or (*b*) statements of numbers, or (*c*) statements of price, or (*d*) statements of quality, or (*e*) statements of names of places, seeks to register such trade marks, they may be registered as a series in one registration. A series of trade marks shall be assignable and transmissible only as a whole, but for all other purposes each of the trade marks composing a series shall be deemed and treated as registered separately.

67.—A trade mark may be registered in any colour, and such registration will (subject to the provisions of this Act) confer on the registered owner the exclusive right to use the same in that or any other colour.

68.—Every application for registration of a trade mark under this part of this Act must as soon as may be after its receipt be advertised by the comptroller.

69.—(1) Any person may within two months of the first advertise ment of the application, give notice in duplicate at the Patent Office of opposition to registration of the trade mark, and the comptroller must send one copy of such notice to the applicant. (2) Within two months after receipt of such notice or such further time as the comptroller may allow, the applicant may send to the comptroller a counter statement in duplicate of the grounds on which he relies for his application, and if he does not do so will be deemed to have abandoned his application. (3) If the applicant sends such counter statement the comptroller will furnish a copy thereof to the person who gave notice of opposition, and must require him to give security in such manner and to such amount as the comptroller may require for such costs as may be awarded in respect of such opposition; and if such security is not given within fourteen days after such require ment was made, or such further time as the comptroller may allow, the opposition will be deemed to be withdrawn. (4) If the person who gave notice of opposition duly gives such security as aforesaid, the comptroller shall inform the applicant thereof in writing, and thereupon the case shall be deemed to stand for the determination of the Court.

70.—A trade mark, when registered, can be assigned and transmitted only in connection with the goodwill of the business concerned in the particular goods or classes of goods for which it has been registered, and will be determinable with that goodwill.

71.—Where each of several persons claims to be registered as proprietor of the same trade mark the comptroller may refuse to register any of them until their rights have been determined according to law, and the comptroller may himself submit or require the claimants to submit their rights to the Court.

72.—(1) Except where the Court has decided that two or more persons are entitled to be registered as proprietors of the same trade mark the comptroller must not register in respect of the same goods or description of goods a trade mark identical with one already on the register with respect to such goods or description of goods. (2) The comptroller must not register with respect to the same goods or description of goods a trade mark so nearly resembling a trade mark already on the register with respect to such goods or description of goods as to be calculated to deceive.

73.—It will not be lawful to register as part of or in combination with a trade mark any words the exclusive use of which would by reason of their being calculated to deceive or otherwise be deemed disentitled to protection in a Court of Justice, or any scandalous design.

74.—(1) Nothing in this Act is to be construed to prevent the comptroller entering on the register, in the prescribed manner, and subject to the prescribed conditions, as an addition to any trade mark—(*a*) In the case of an application for registration of a trade mark used before the thirteenth day of August one thousand eight hundred and seventy-five: Any distinctive device, mark, brand, heading, label, ticket, letter, word, or figure, or combination of letters, words, or figures, though the same is common to the trade in the goods with respect to which the application is made; (*b*) In the case of an application for registration of a trade mark not used before the thirteenth day of August one thousand eight hundred and seventy-five: Any distinctive word or combination of words, though the same is common to the trade in the goods with respect to which the application is made. (2) The applicant for entry of any such common particular or particulars must, however, disclaim in his application any right to the exclusive use of the same, and a copy of the disclaimer will be entered on the register. (3) Any device, mark, brand, heading, label, ticket, letter, word, figure, or combination of letters, words, or figures, which was or were, before the thirteenth day of August one thousand eight hundred and seventy five, publicly used by more than three persons on the same or a

similar description of goods will, for the purposes of this section, be deemed common to the trade in such goods.

EFFECT OF REGISTRATION.

75.—Registration of a trade mark will be deemed to be equivalent to public use of the trade mark.

76.—The registration of a person as proprietor of a trade mark will be *primâ facie* evidence of his right to the exclusive use of the trade mark, and will, after the expiration of five years from the date of the registration, be conclusive evidence of his right to the exclusive use of the trade mark, subject to the provisions of this Act.

77.—A person will not be entitled to institute any proceeding to prevent or to recover damages for the infringement of a trade mark unless, in the case of a trade mark capable of being registered under this Act, it has been registered in pursuance of this Act, or of an enactment repealed by this Act, or, in the case of any other trade mark in use before the thirteenth of August one thousand eight hundred and seventy-five, registration thereof under this part of this Act, or of an enactment repealed by this Act, has been refused. The comptroller may, on request, and on payment of the prescribed fee, grant a certificate that such registration has been refused.

REGISTER OF TRADE MARKS.

78.—There will be kept at the Patent Office a book called the Register of Trade Marks, wherein will be entered the names and addresses of proprietors of registered trade marks, notifications of assignments and of transmissions of trade marks, and such other matters as may be from time to time prescribed.

79.—(1) At a time not being less than two months nor more than three months before the expiration of fourteen years from the date of the registration of a trade mark, the comptroller must send notice to the registered proprietor that the trade mark will be removed from the register unless the proprietor pays to the comptroller before the expiration of such fourteen years (naming the date at which the same will expire) the prescribed fee; and if such fee be not previously paid, he will at the expiration of one month from the date of the giving of the first notice send a second notice to the same effect. (2) If such fee be not paid before the expiration of such fourteen years the comptroller may after the end of three months from the expiration of such fourteen years remove the mark from the register, and so from time to time at the expiration of every period of fourteen years. (3) If before the expiration of the said three months the registered proprietor pays the said fee together with the additional prescribed fee, the comptroller may without removing such trade mark from the register accept the said fee as if it had been paid before the expiration of the said fourteen years. (4) Where, after the said three months, a trade mark has been removed from the register for non-payment of the prescribed fee, the comptroller may, if satisfied that it is just so to do, restore such trade mark to the register on payment of the prescribed additional fee. (5) Where a trade mark has been removed from the register for non-payment of the fee or otherwise, such trade mark shall nevertheless, for the purpose of any application for registration during the five years next after the date of such removal, be deemed to be a trade mark which is already registered.

FEES.

80.—There must be paid in respect of applications and registration and other matters under this part of this Act such fees as may be from time to time, with the sanction of the Treasury, prescribed by the Board of Trade; and such fees will be levied and paid to the account of Her Majesty's Exchequer in such manner as the Treasury may from time to time direct.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine share-dealer, Redruth (Nov. 22), writes:—Our market has been very quiet all the week. Dolcoaths, Carn Breas, and Wheal Bassets declined, but Wheal Unys and West Frances advanced. To-day market is very quiet, but Dolcoath, West Kitty, and West Frances are steady. Tin standards fell 2s. on Tuesday to 81s., 83s., and 85s. Subjoined are the closing quotations:—Blue Hills, ¼ to ½; Carn Brea, 2 to 2½; Cook's Kitchen, 12 to 13; Dolcoath, 63¼ to 63¾; East Pool, 39½ to 40; Killifreth, 1⅜ to 1⅝; New Cook's Kitchen, 3 to 3⅛; New Kitty, 1¾ to 2; Penhalls, ¼ to ⅜; Pedn-an-drea, ⅜ to ⅝; South Condurrow, 9 to 9½; South Croity, 4¾ to 5; South Frances, 7 to 7⅛; Tincroft, 5¼ to 5¾; West Basset, 2 to 3; West Frances, 8 to 8⅛; West Kitty, 12⅞ to 13⅛; West Seton, 7 to 9; Wheal Agar, 12⅛ to 13; Wheal Basset, 4⅞ to 5⅛; Wheal Grenville, 5¾ to 6; Wheal Peevor, 2 to 2⅛; Wheal Kitty, 1 to 1¼; Wheal Uny, 1⅝ to 1⅞; West Tolgus, 8 to 10; West Polbreen, ⅝ to ⅞.

— Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (Nov. 22) write:—A moderate business has been done in Dolcoath, East Pool, Killifreth, South Crofty, Wheal Basset, and Wheal Uny during the past week. The tin standards have been reduced 2, but this has not influenced the market to any extent. Closing quotations herewith:—Blue Hills, ⅛ to ⅜; Carn Brea, 2 to 3; Cook's Kitchen, 12 to 13; Dolcoath, 63¼ to 63¾; East Pool, 39½ to 39¾; Killifreth, 1⅜ to 1⅝; Penhalls, ¼ to ½; New Cook's Kitchen, 3 to 4; New Kitty, 1¾ to 2; South Condurrow, 9 to 9½; South Crofty, 4½ to 5; South Wheal Frances, 7 to 7⅛; Tincroft, 5¼ to 6; West Basset, 3 to 3⅛; West Kitty, 12¾ to 13⅛; West Peevor, 1⅝ to 2⅛; West Frances, 7⅛ to 8; West Tolgus, 10 to 12; West Seton, 8 to 9; Wheal Agar, 12⅛ to 13; Wheal Basset, 4¾ to 5¼; Wheal Grenville, 5¼ to 6¾; Wheal Kitty (St. Agnes), 1 to 1¼; Wheal Peevor, 3 to 4; Wheal Uny, 1⅝ to 1⅞.

— Mr. M. W. BAWDEN, Liskeard (Nov. 22), writes:—The mining market has been a shade firmer throughout the week, although the price of tin has further receded, and a reduction of 2*l.* has been made by the smelters on the standard. Dolcoath, East Pool, Prince of Wales, Wheal Crebor, and Wheal Uny chiefly enquired for. Subjoined are the closing quotations:—Bedford United, 1⅜ to 1½; Carn Brea, 2¾ to 3; Cook's Kitchen, 12½ to 13; Dolcoath, 63 to 63¼; Devon Consols, 2 to 2⅛; Devon Great United, ¼ to ⅜; East Caradon, ¼ to ⅜; East Pool, 39½ to 40; Gawton United, 2s. 6d. to 5s.; Glasgow Caradon, ⅜ to ½; Gunnislake (Clitters), 1¾ to 2; Herodsfoot, ⅛ to ¼; Hingston Down, ½ to ¾; Killifreth, 1⅝ to 1¾; Marke Valley, ½ to ⅝; New West Caradon, ⅜ to ½; Old Gunnislake, ½ to ⅝; Phœnix United, 1¼ to 1⅜; Prince of Wales, ⅜ to ½; South Caradon (Limited), fully paid, ⅞ to 1; South Condurrow, 9 to 9½; South Crofty, 5 to 5¼; South Devon United, ⅜ to ½; South Frances, 7¼ to 7½; Tincroft, 6 to 6¼; West Basset, 3¾ to 4; West Caradon, ½ to ¾; West Kitty, 12¾ to 13; West Mary Ann, ¾ to ⅞; West Crebor, ⅜ to ½; West Phœnix, ½ to ¾; Wheal Agar, 13 to 13¼; Wheal Crebor, 2½ to 2⅝; Wheal Grenville, 5¾ to 6; Wheal Hony and Trelawny, ½ to ¾; Wheal Kitty, ⅞ to 1; Wheal Jane, ¾ to ⅞; Wheal Peevor, 2⅞ to 3; Wheal Uny, 1¾ to 2; West Frances, 6 to 6¼; Wheal Basset, 5 to 5¼.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, share brokers, Queen's Chambers, Market-street (Nov. 22), write:—Taken all round the past week has been a comparatively uneventful one, and the course of prices for leading home investments has been in buyers favour, though the depreciation does not amount to anything serious in any instance. Foreign funds are quiet and irregular, Italians, Russians, and Turks stamped are higher, whilst Egyptian Unified ditto Preference and ditto Daira Sanieh, Mexican 3 per cent., and Peruvians are lower, but nowhere is the alteration more than fractional. Mexican rails have fluctuated a little. On Saturday last they lost the gain they had made the previous day, coming rather under last Thursday's figures, but on Monday they rallied again, and since then have moved distinctly upward, establishing fresh advance each day, reaching at the close this evening 75¾ to 76, or a rise on the week of about 12 per cent. The several series of investments grouped as miscellaneous are on the whole steady, Banks, Insurance, and Telegraphs showing strength, whilst miscellaneous proper do not show much change of moment.

BANKS exhibit a strong tone, though not many transactions are recorded. Where business has been done, however, prices comparing well with recent quotations have been obtained, and the changes in quotations show very slight falling off, whilst there are some fair advances to be noted.—Higher: National Provincial (new), ½; Parr's Banking, ½; Bank of Liverpool, ¼; Liverpool Commercial, ¼; and Lancashire and Yorkshire, ½.—Lower: Manchester and Liverpool District, ½. Sellers of Manchester Joint-Stock down ½; buyers unaltered.

INSURANCE.—More transactions reported than of late, and quotations show a favourable majority of changes.—Higher: Commercial Union, ½; Sea, ¼; British and Foreign Marine, ⅜; London and Liverpool and Globe, 1/16 to 3/16; Lancashire, 1/16; and British Re Insurance, 6*d.*—Lower: Royal, 1/16 to 3/16; Queen, ½; and Lancashire and Yorkshire Accident, 9*d.* to 1*s.* 3*d.*

COAL, IRON, &c., AND MINING.—A comparatively numerous record of dealings is to be reported, but of a straggling character, only Ebbw Vales and Bolckows producing more than solitary transactions, and the business in them but of very meagre extent. Quotations have a fair show of alterations, the majority being adverse, but the majority is not so decided as to warrant a description of this market as distinctly weak. Higher: Bolckows, 12*l.* paid, ½; Great Laxey Lead, ⅛ to 1; Rio Tinto to bearer and registered, both 1; Telegraph Construction and Maintenance, ⅛; and Panulcillo Copper, ⅛. Lower: Tredegar Coal, &c., A, 1 to 2; Ebbw Vale, ⅛; John Browns, ¼; Cammells, ⅛; Palmers, A, ⅛; ditto, B, ⅛ to ⅜; and Llynvi Pref., ⅛.

COTTON SPINNING, &c., shares steady, but not brisk, margin of profit not being such as to give much impetus to buyers.

TELEGRAPHS show an almost all-round improvement, and only Easterns with a fall of ⅛ showing any decline, whilst Anglos of all issues, Direct United States Cable, Globe Ordinary, and Western and Brazils are all more or less improved in price.——TELEPHONES very quiet, and the only change of importance is a rise of ⅛ in Uniteds.

MISCELLANEOUS.—Beyond a recovery of 3/16 to ¼, and the fluctuations in Hudson's Bay (which after being decidedly lower now show a fall on the week of ⅛ to ⅜ only) there is nothing worth recording.

RAILWAYS.—Home rails have drooped all round with the single exception of Brightons, Ordinary and A's, the former more particularly. Great Easterns alone, however, show more than fractional decline, being 1⅛ down, the other changes being very slight. Canadians dull and lower, but the fall on the week is very trifling; traffic return 749*l.* increase. Americans continue to be "shuttle-cocked," up one day and down the other, without any balance of movement.

NEWCASTLE-ON-TYNE.—Mr. S. N. CHALLONER, stock and share broker, Grey-street (Nov. 22), reports:—Local markets have been very quiet during the past week; on the whole, prices are lower. Sir W. G. Armstrong Mitchell shares are 132½ to 133½. Consett Iron, 23 to 23½; Bede Metal, 14; Bolckow, fully paid, 19 to 19½; 12 paid, 10⅝ to 10⅞; and preference, 19¼ to 20; C. Cammell and Co., 68¼ to 69¼; Consett Spanish Ore, 51s. to 52s.; Darlington Iron, 15s. to 20s.; Ebbw Vale, 5⅞ to 6; John Brown, 61 to 61½; Marbella Iron Ore, 67s. 6d. to 68s.; Monkland Iron, 62s. to 63s.; Palmer, A, 27 to 27½; B, 17 to 17¼; West Cumberland Iron, 7¼ to 7⅝. Teesside Iron, pref., 1*l.* 15s. to 1*l.* 16s. 3d. Langdales, 3⅝ to 3¾; Lawes, 6 to 6⅛; Sadler and Co., 7*l.* paid, 8 to 9.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, stockbroker and ironbroker (Nov. 22), writes:—During the past week markets have continued inactive. There is still a want of confidence among purchasers, no doubt due to the uncertain state of trade both at home and abroad. The money market remains easy.

In shares of coal, iron, and steel companies the principal alteration is a decline in Shott's Iron to 40. Marbellas have declined from 72s. 6d. to 67s. and Ebbw Vales to 6. Bull's Iron and Steel are at 20s. to 30s.; Chillington, 20s. to 25s.; Cardiff and Swansea, 55s. to 65s.

In shares of foreign copper concerns prices are steady. Rio Tinto declined to 18¾, but have since recovered to about 20. Copiapo has announced a further dividend of 3s. per share, making 7s. 6d. per share for last year. Tharsis have improved from 6*l.* 8s. 6d. to 6*l.* 10s.; Belt Copper offered; Norway Copper preference, 1s. 3d.; Tocopilla, 4s. to 6s.

In shares of home mines prices are steady, with a little more demand in some cases. Bwlch United, 2s. to 4s.; Camborne Vean, 2s. 9d.; Carnarvonshire Great Consols, 5s. to 10s.; East Blue Hills, 3s. to 5s.; East Devon Consols, 5s. to 10s.; East Wheal Rose, 5s. to 7s.; East Uny, 1s. 3d.; Frongoch, 11s.; Goginan, 5s. to 7s.; Gorsedd and Merllyn, 20s. to 30s.; Herodsfoot, 1s.; Killifreth, 30s; Kit Hills, 2s. to 4s.; North Penstruthal, 2s. 6d.; North Blue Hills, 1s.; North Grogwinion, 1s. 3d.; North Busy, 2s. 6d.; New Kitty 37s.; Old Shepherds, 6s. to 8s.; Prince of Wales, 12s. to 13s.; Parys, 1s. 6d. to 2s. 6d.; Penhalls, 5s. to 7s. 6d.; Pedn-an-drea, 10s. 6d.; Rhosesmors, 27s. to 30s.; South Penstruthal, 10s.; Tresaveans, 5s. to 7s. 6d.; Tregontrees, 2s. 3d.; Tamar, 10s. to 12s.; West Basset, 61s.; West Polbreen, 15s. to 20s.; Wheal Basset, 5 to 5¼; Wheal Comford, 1s. to 2s.; Wheal Jane, 9s. to 11s.; Wheal Kitty, 21s.; and Wheal Peevor, 56s.

In shares of gold and silver mines the principal business has been in United Mexicans, which touched 9⅛ on the increased weekly profits reported, and their prospects of striking a good lode; but there has been a decline on realisations. Richmonds unaltered. Antioquia, Olathe, and Silver Peak Debentures all offered. Akankoo are 3s. to 5s.; Asia Minor, 12s.; Callao Bis, 8s. to 10s.; Cankim Bamoo, 9s. 6d.; Crooke's, 17s. 6d.; Chile Debentures, 90s. to 95s.; Flagstaff, 1s. 6d. to 2s. 6d.; Guinea Coast, 3s. to 5s.; Gold Coast, 5s. to 7s.; Silver Hill, 2s. 6d. to 3s. 9d.; Kapanga, 2s. to 3s.; Kohinoor, 6s. to 8s.; La Plata, 8s. 6d.; Montana, 45s. to 47s. 6d.; New Callao, 5s. to 7s. 6d.; New Gold Run, 1s.; Organos, 15s. to 17s.; Rio Grande do Sul, A, 3s. 9d.; Silver Peaks, 1s. 9d.; West Callao, 7s. 6d. to 12s. 6d.; Victoria, 15s. to 17s. 6d.; and Yuba Rivers, 2s. 6d. to 3s. 9d.

In shares of oil and miscellaneous companies, prices are generally lower. Oil companies shares are depressed, owing to the competition expected from the new companies. Burntisland Oil have declined from 22¾ to 21⅞; Droitwich Salt, offered; Home Mines Trust, 9s. to 11s.; Lawes' Chemicals, 5⅞ to 6¼. Nobel's Explosives have improved from 22¼ to 24. A new company, the International Explosives, has also been announced, and is considered to have very favourable prospects.

EDINBURGH.—Messrs. THOS. MILLER and SONS, stock and share brokers, Princes-street (Nov. 21), write:—The principal movement in home railway stock during the past week has been a somewhat heavy fall in Great Eastern. Brighton Deferred has also been depressed, while East London has come into demand at a considerable improvement. Canadian show no change of importance. A considerable business has been done in oil shares; but prices of these have rather fallen. A large business has been done in Arizona, the price of which shows an improvement of 5s. 3d.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (Nov. 21), write:—Markets were again very quiet to-day, and Great Southerns changed hands at 120¼, and Midlands at 85⅝. No change in Limericks or Macrooms. National Banks were done at 24⅞ to 25, and Provincials at 32¼. Munsters were done at 6⅜ to 6 13-16. No change in Hibernians. Alliance Gas changed hands at 18¾, and Cork Gas at 7 3-16. Steam Packets were also purchased at 11¼, and Lyons shares 5*l.* paid asked for at 6⅜. Gouldings remain 9¼, and Gresham Hotels 3⅜ to 3½. Brewerys are still offered at 4⅜ to 4¼, and the Debentures at 96 to 97.

AUSTRALIAN OPALS.—The precious opal of New South Wales has the milky body colour usually possessed by this mineral, and the same brilliant play of colours; the dominant colours of the scintillations are metallic green, pink, and red. Some of the best specimens form, when polished, very fine gem stones; but here, as elsewhere, the valuable specimens obtained bear but a small proportion to the whole. The best have been obtained from Rocky Bridge Creek, Abercrombie river, County Georgiana; the matrix is a fine-grained bluish-grey amygdaloidal trachyte, some 30 ft. thick, which is so much altered that it can be abraided by the thumb-nail; the opal has filled by infiltration certain of the vesicular cavities and crevices in the rock; it is associated with much common opal free from any play of colour and hyalite.

COPPER AND COPPER-MINING IN NEW SOUTH WALES.—The copper lodes in the colony were first opened about 25 years ago, the most important mine at present being the Great Cobar Mine, which is also the most distant from the seaboard, being 497 miles west of Sydney. The quantity of ore already smelted at this mine is 69,118 tons, producing 9182 tons of fine copper. In 1881, 21,552 tons of ore were smelted, producing 2568 tons of copper. The lode occurs in Silurian slates; it varies in width up to 100 ft. On the surface appear the outcrops of two adjacent parallel lodes; it is believed, however, that all three form one lode, being only separated by pieces of ground known to miners as horses. At Nymagee, in the Cobar district, a large and valuable copper lode is now being extensively worked. In the same district, the Girilambone Copper Mine, situated 60 miles east of Cobar, has been opened. This mine is only 1½ mile from the proposed line of railway to Bourke. About 90 miles south of Cobar is the Mount Hope Copper Mine. Besides copper, gold and tin have been discovered in the country lying between the Lachlan and Bogan rivers, which will doubtless become a most important mining district. Copper lodes have also been opened and more or less worked in years past at Peelwood, Cow Flat, Wiseman's Creek, Thompson's Creek, Carangara, Ophir, Cadia, Canoblas, Carcoar, Icely, Molong, Goodrich, Balara, Snowball, Frogmore, and near Goulburn; the existence of other lodes are known of in the Wellington, Murrumbidgee, Bombala, Braidwood, Grafton, and Albert districts. Gold, silver, lead, zinc, and bismuth, are sometimes found in the copper ores. During the last two or three years several rich copper lodes have been discovered in the vicinity of Blayney, and close to the Great Western Railway line. Considering the extent of copper-bearing country, the progress hitherto made in copper mining has not been too considerable. The want of success which has attended the attempts to develope the copper lodes of New South Wales has, it is feared, in many cases been due to want of skill on the part of those engaged in the attempt; but with increased experience, and the example of well managed copper mines to serve as a guide a bright future should be awaiting this branch of colonial mining industry.

CORNISH PUMPING-ENGINES.—The number of pumping-engines reported for Nov. is 14. They have consumed 1872 tons of coal, and lifted 12·3 million tons of water 10 fms. high. The average duty of the whole is, therefore, 44,400,000 lbs. lifted 1 ft. high by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

	Millions
Dolcoath—85 in.	50·1
Mellanear—76 in.	53·7
West Basset—Thomas's 60 in.	51·3
West Tolgus—Richard's 70 in.	45·7
West Wheal Seton—Harvey's 85 in.	55·9
West Wheal Seton—Rule's 70 in.	46·0

HOLLOWAY'S PILLS.—The sudden changes, frequent fogs, and pervading dampness sorely impede the vital functions and conduce to ill-health. The remedy for these disasters lies in some purifying medicine, like these pills, which is competent to grapple with the mischief at its source, and stamp it out without fretting the nerves or weakening the system. Holloway's pills extract from the blood all noxious matters, regulate the action of every disordered organ, stimulate the liver and kidneys, and relax the bowels. In curing chest complaints these pills are remarkably effective, especially when aided by friction of the ointment on its walls. This double treatment will ensure a certain, steady, and beneficient progress, and sound health will soon be re-established.

ESTABLISHED 1825.

EDWIN LEWIS AND SONS,

Patent Tube Works, MONMORE GREEN and Britannia Boiler Tube Works, ETTINGSHALL,

WOLVERHAMPTON.

MANUFACTURERS OF

Lapwelded & Buttwelded Wrought-iron, Steel, or Homogeneous Tubes

FOR EVERY

COLLIERY OR MINING PURPOSE.

THE NEW PATENT FLAX BELTING.

The Only Good Belt made of Textile Fabric.—Manufactured solely from the best Russian Flax.

SPECIALITY FOR DYNAMOS, SAW MILLS, AND MAIN DRIVING PURPOSES.

Price List and Particulars from—

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MANCHESTER WIRE WORKS.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

PERFORATED IRON, STEEL, COPPER, AND ZINC PLATES IN VARIOUS DIMENSIONS AND THICKNESSES.

Shipping Orders Executed with the Greatest Dispatch

TUBES

SILVER MEDAL (HIGHEST AWARD) MELBOURNE, 1881.

JOHN SPENCER,

Globe Tube Works, WEDNESBURY,

AND 3, QUEEN STREET PLACE, CANNON STREET, LONDON, E.C.

FIRST PRIZE, SYDNEY, 1880.

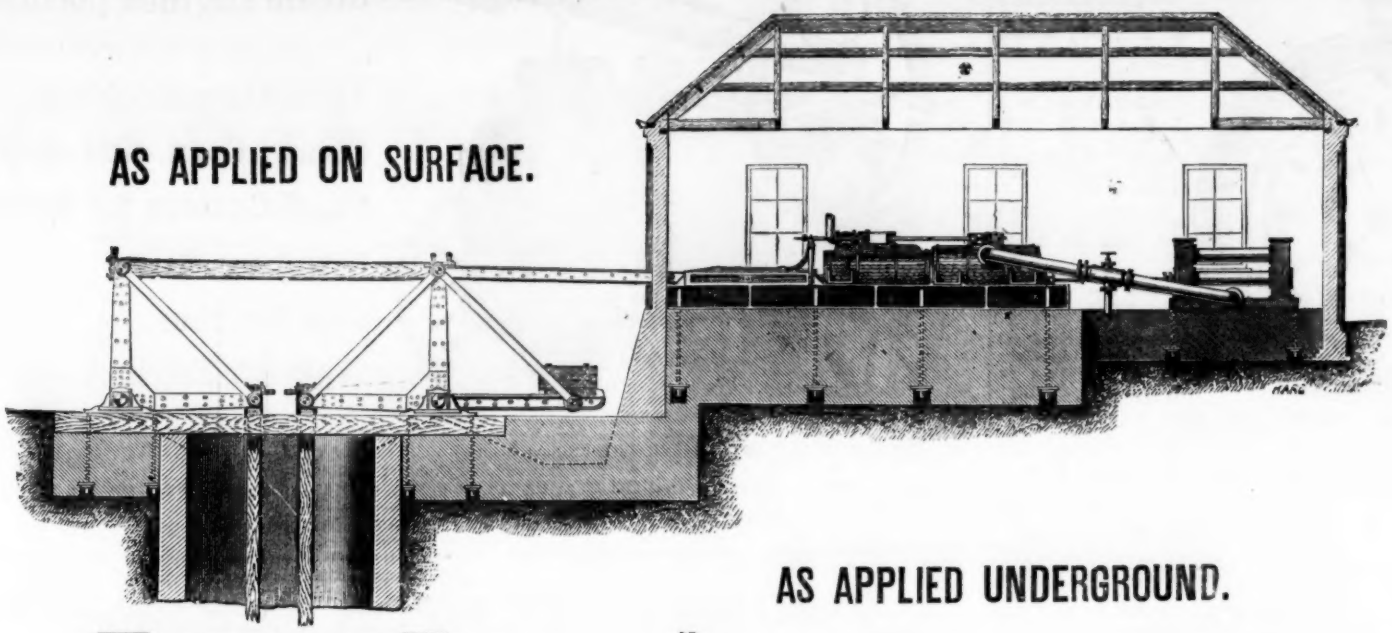
TUBES AND FITTINGS for Gas, Steam, and Water; Galvanised, Enamelled, and Hydraulic Tubes; Boiler Tubes and Fittings; Gas Fitters' Tools; Brass Cocks, &c.

ANTI-CORRODO TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS.

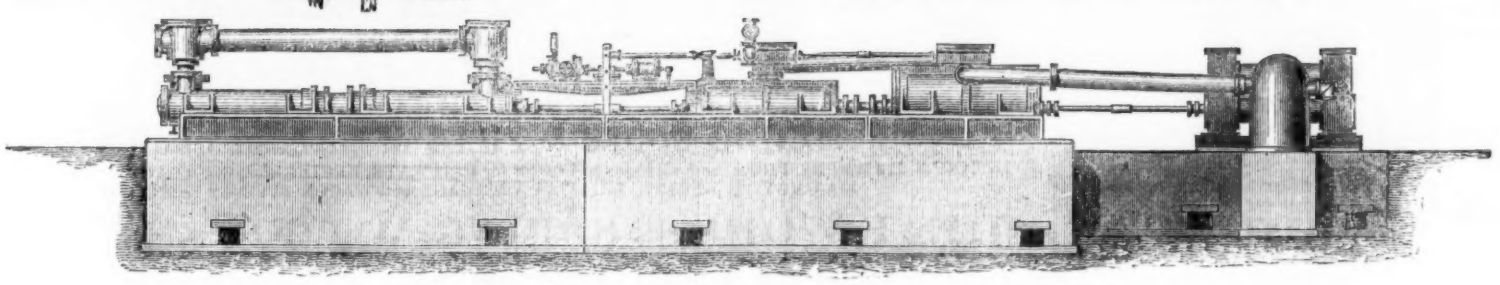
HATHORN, DAVEY AND CO., LEEDS.

THE DIFFERENTIAL PUMPING ENGINE.

AS APPLIED ON SURFACE.



AS APPLIED UNDERGROUND.

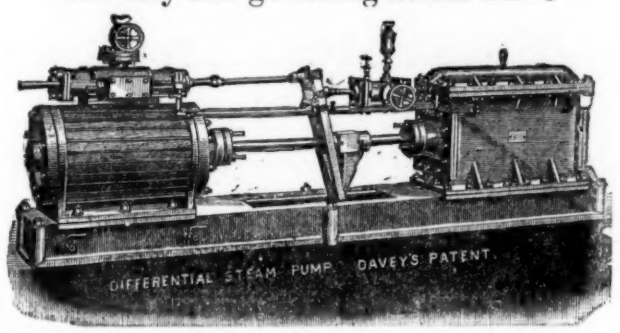


MINING MACHINERY OF ALL KINDS.

Hydraulic Pumping Engines and Hydraulic Machinery of all kinds.

THE DIFFERENTIAL STEAM PUMP.

The only Self-governing Steam Pump.



See Reduced Price List.

PRICE LIST.

Diameter of Steam Cylinder. Inches.	Diameter of Water Cylinder. Inches.	Length of stroke. Inches.	Gallons per Hour.	Height to which water can be raised with 40 lbs. steam pressure. Feet.	PRICE. £	Price with Condenser, in Suction Pipe. £	Price with Air Pump Condenser. £	Diameter of Suction and Delivery Pipes. Inches.	Diameter of Steam Pipe. Inches.	Diameter of Exhaust Pipe. Inches.
10	5	15	5,200	250	65	72	85	5 3/4	1 1/4	2 1/2
10	7	15	10,400	130	70	80	100	6	1 1/2	2 1/2
10	9	15	17,300	70	85	100	120	4 1/2	1 1/2	2 1/2
12	6	24	6,500	250	90	104	130	5 1/2	2	2 3/4
12	7	24	10,500	180	96	110	136	6	2	2 3/4
12	8	24	13,500	140	100	114	142	7	2	2 3/4
12	10	24	21,300	90	120	136	175	5 1/2	2	2 3/4
14	7	24	10,400	250	110	130	156	6 1/2	2 1/2	3
14	8	24	13,500	190	120	145	165	6	2 1/2	3
14	9	24	17,300	150	130	150	172	6 1/2	2 1/2	3
14	10	24	21,300	120	140	162	190	7 1/2	2 1/2	3
14	12	24	30,800	80	160	190	216	9	2 1/2	3
16	8	24	13,700	250	140	170	195	6	3	3 1/2
16	9	24	17,300	200	150	180	215	6 1/2	3	3 1/2
16	10	24	21,300	160	160	196	225	7 1/2	3	3 1/2
16	12	24	30,800	110	180	220	246	9	3	3 1/2
16	14	24	42,000	80	200	242	264	10 1/2	3	3 1/2

SMELTING FURNACES.—The Water Jacket Furnaces, for both lead and copper ores, built by Messrs. Rankin, Brayton, and Co., of the Pacific Ironworks, San Francisco, have worked a revolution in the smelting business of the country. The advantages demonstrated in these furnaces are facility and cheapness of transportation and construction, economy of fuel, fineness of bullion produced, and capacity for continuous and uninterrupted work. Any ore that can be smelted can be worked cheaper in these furnaces than by any other process. The mining interests of the country are largely indebted to the enterprise of this firm for working up to such a state of perfection this important branch of mining machinery. A large number of companies in Arizona, New Mexico, Nevada, Idaho, and Utah are operating these furnaces with most satisfactory results.
—*Arizona Daily Star*, U.S.A.

SWEDISH MINES AND RAILWAYS.—The mines of Lapland, and the proposed railroad from Ofaten Fjord to a port in the Baltic, so as to give them shipping facilities on the Atlantic and the Baltic, have been already referred to. The concession was obtained from the Swedish Government on Dec. 8, 1882, by Prof. J. W. Arnberg, Capt. C. G. Hierta, and Dr. H. Ljunggren, who are empowered to enter into a contract with the English engineering firm of Wilkinson, Jarvis, and Co., for the construction of the railroad. It has been stipulated, however, that from Gellivara southwards the line is to follow the valley of the Lulea river, terminating at the port of that name, instead of taking the more northerly direction, as originally projected and indicated in the map annexed to the report for 1881. All lands belonging to the Crown on the line have been given up to the concessionists free of cost, and the construction of the railway, which is to be completed in 1891, will be commenced simultaneously at each end in the summer of 1884. With regard to the construction of a branch line to Tore and Haparanda, the grant is made under the following conditions:—"If His Majesty considers the time suitable for the construction of a branch line to Haparanda, the owners of the main line will be entitled, during a term of 15 years, to claim the concession before any other private persons or company who do not offer the State more advantageous terms." The demand for iron and steel was fairly good in 1882 from Gefle, and a steady satisfactory trade has been done. Prices opened at about the rates mentioned below, and very few fluctuations took place. Lately the market has been somewhat disturbed by the uncertainty hanging over the American requirements, caused by the agitation in that country on the subject of the tariff duties on iron and steel products.

S. MASON & CO.

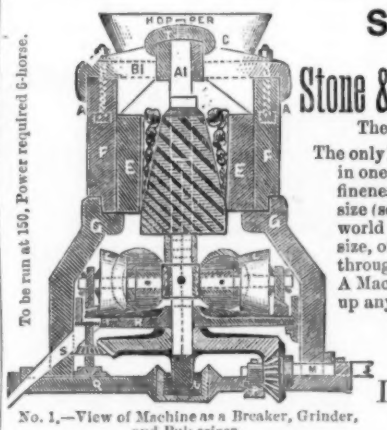
NEW PATENT CIRCULAR

Stone & Ore Breaker, Grinder & Pulverizer

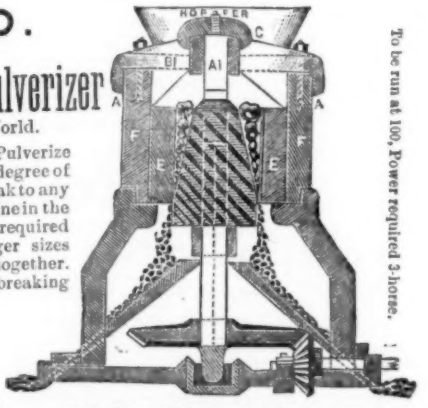
The Simplest and Strongest Machine in the World.

The only Machine made that will Break, Grind, and Pulverize in one operation either wet or dry mineral to any degree of fineness, also by taking away the rollers it will break to any size (see illustration No. 2.) This is the only machine in the world that will reduce all that is put into it to the required size, other machines open and shut, so let larger sizes through than what is wanted, besides mixing them together. A Machine can be seen at the Works in motion, breaking up any required mineral.

To be run at 150, Power required 6-horse.



No. 1.—View of Machine as a Breaker, Grinder, and Pulverizer.



No. 2.—View of Machine as a Breaker for different sizes.

To be run at 100, Power required 3-horse.

S. MASON & CO.,

STONE MACHINE WORKS,

LEICESTER, ENGLAND.

READ THIS—

To Messrs. S. Mason and Co., July 19th, 1881.

Dear Sirs,—The six Stone Breaking Machines you have supplied to us are doing their work well and giving every satisfaction. Our stone being so hard, we have broken several Machines that we had bought from other firms, but the Machines purchased from you are strong enough to meet our requirements.

Yours truly, S. D. POCHIN, Croft Quarries, near Hinckley.

CAUTION.—Don't buy complicated Stone Breaking Machines. Ours are the Simplest and Strongest in the Market, and will wear double the time without renewal of wearing parts. No other should be sent abroad.

S. M. & Co.'s Roller Mill for Stone, Ore, Bones, &c. The teeth are made harder than steel, and slide on a cylinder, so are easy renewed when required, and are made to suit any material.

S. M. & Co.'s Improved Blake Stone Breaker with Reversible Swing Jaw and Screen. This Jaw is reversible in four ways—twice as many as any other. All our Machines are fitted with steel excentric shafts and toggle grooves. We guarantee no infringement of any patent. References to hundreds of users.

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CENTRE SECOND STOP WATCH

Has lever escapement, compensating balance case and dome, both sterling English Hall Marked Silver. The most perfect Watch yet introduced. It is usually retailed at £8 8s.; our price, free by post, is £2 15s.; warranted for five years.

Our NEW ENGLISH LEVER WATCH, £2 10s., with sterling silver cases, capped and jewelled.

The "EUREKA" GENTLEMAN'S full size silver watch, 17s. 6d.

LADY'S SOLID GOLD WATCH, free by post, for 30s.

Do not pay exorbitant profits, but purchase direct from the workshop.

A fact! A fact! A fact! A watch that will go for 10s.; warranted for six months.

Every description of Watches and Jewellery at proportionately low prices.

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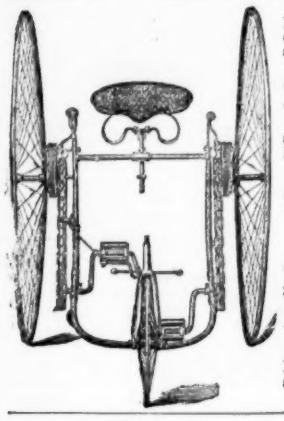
THE "ARION" TRICYCLE,



Front Steerer, Double Driver, fitted either with Patent Balance Gear, or Hill and Morton's Automatic Clutch.

THE LADY'S TRICYCLE, fitted with light framework, a superb Machine, £12.

BICYCLES—The "Arion," the acknowledged best Machines with Ball Bearings.

PERAMBULATORS.

PERAMBULATORS.

The New Bassinette, fitted with Bicycle Wheels, Reversible Hood, &c., from 30s.

The New "Revolving" Perambulator, will turn in any position.

The NEW "METALLIC" BASSINETTE, the admiration of all who have seen it.

GUNS. GUNS.

BREECHLOADERS AND PATENT HAMMERLESS.

NEW DESIGNS,
RIFLES,
PISTOLS,
REVOLVERS, &c.,
OF EVERY PATTERN
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Valuations for Stock Taking or any other purpose upon very reasonable terms

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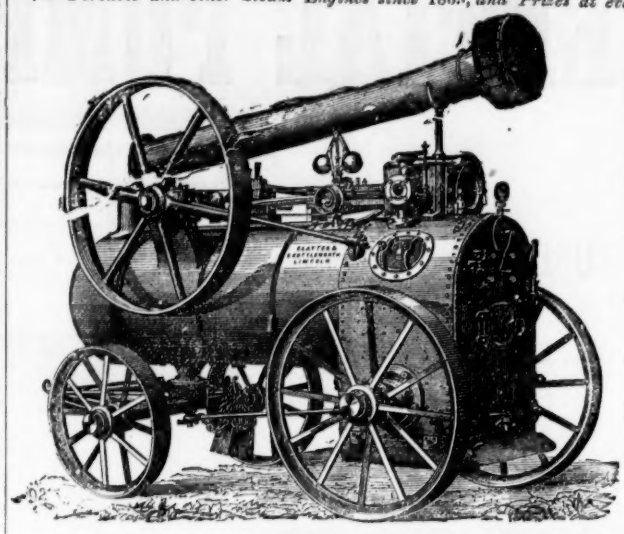

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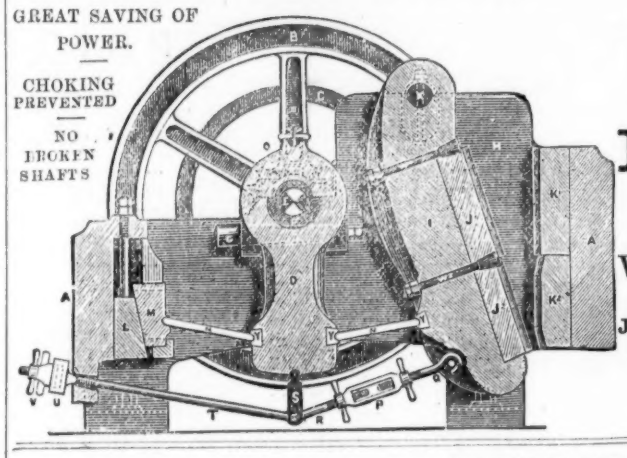

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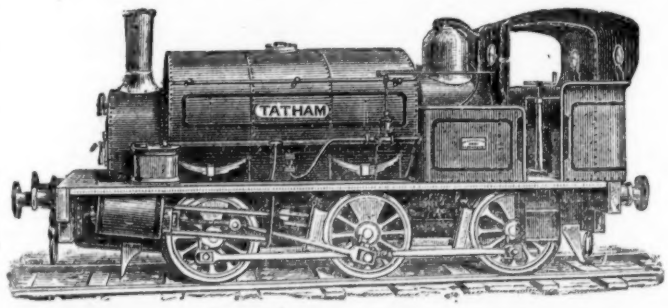

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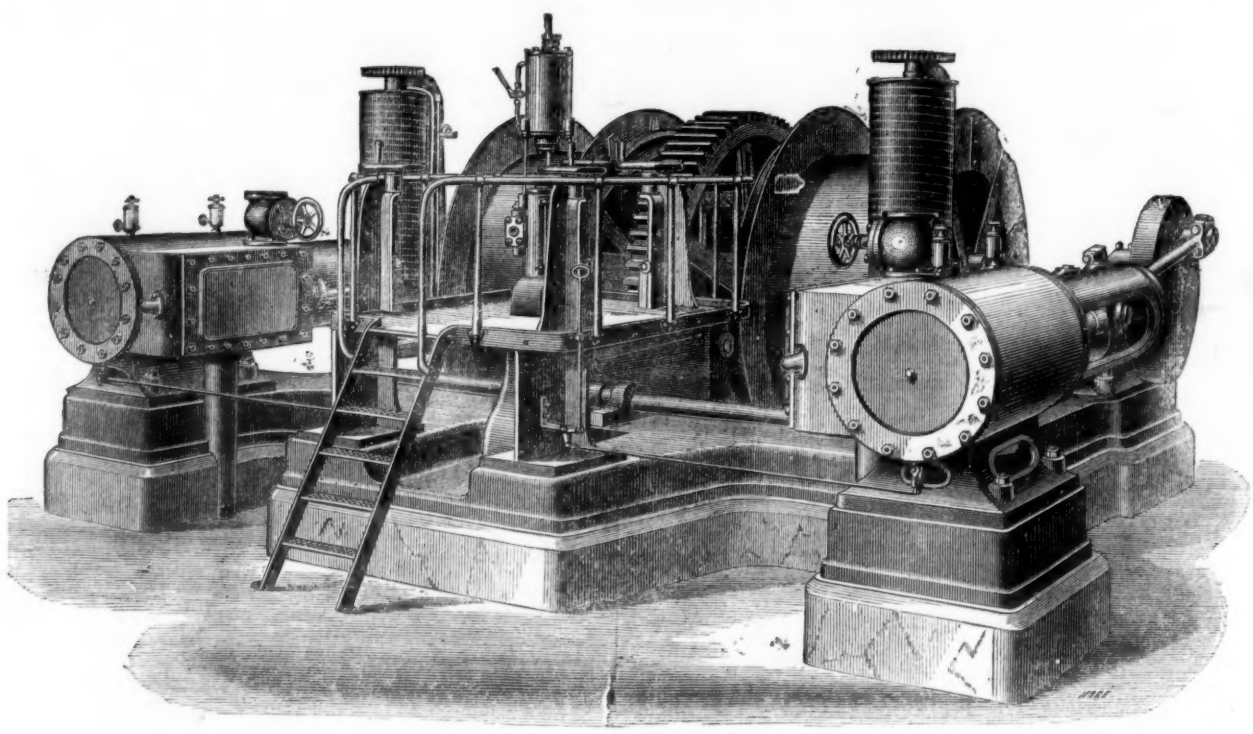

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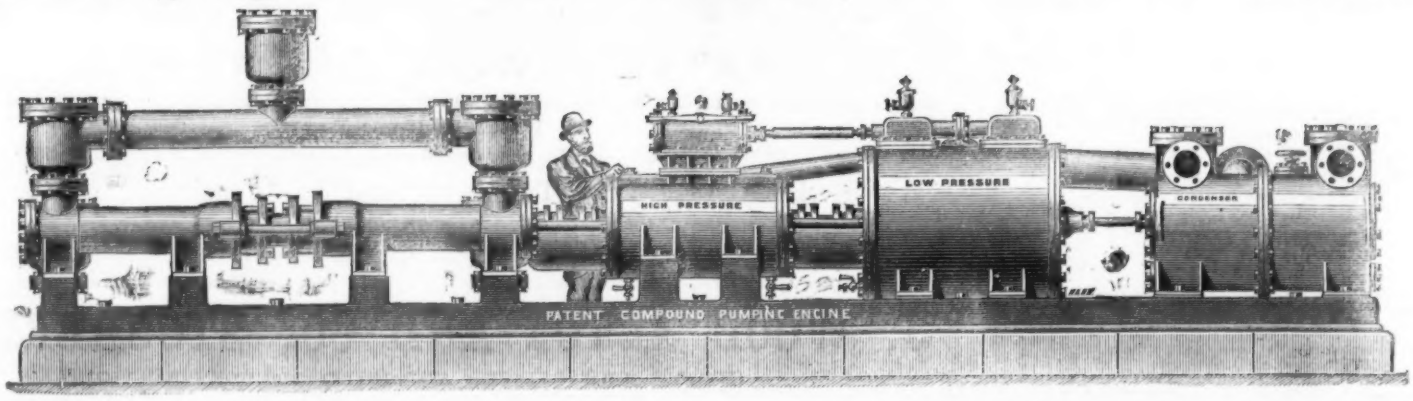

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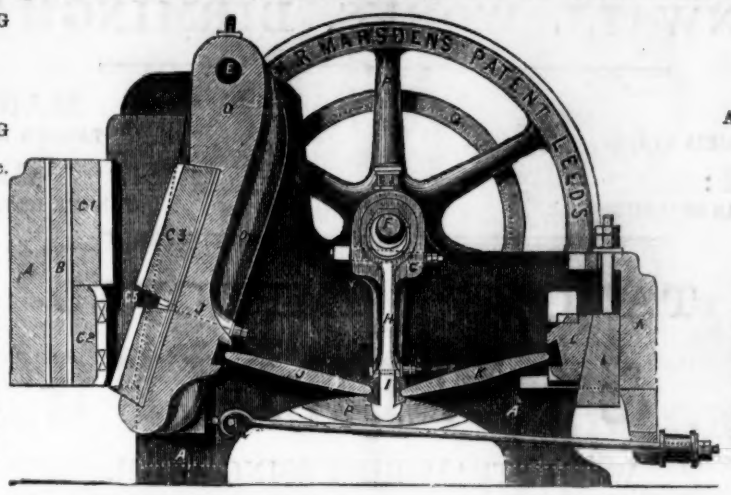

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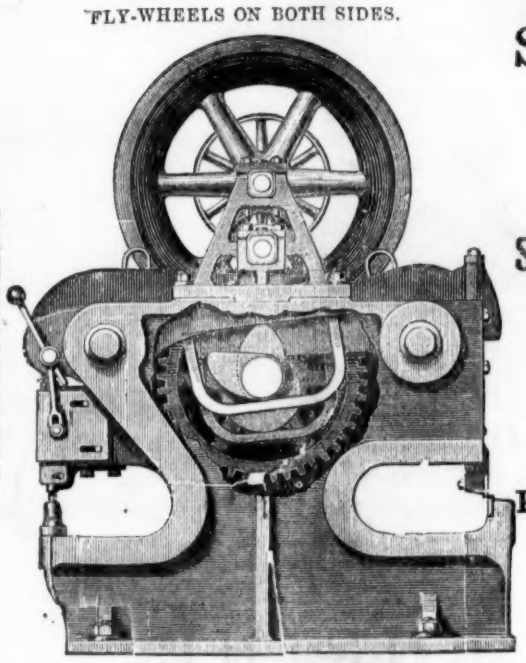

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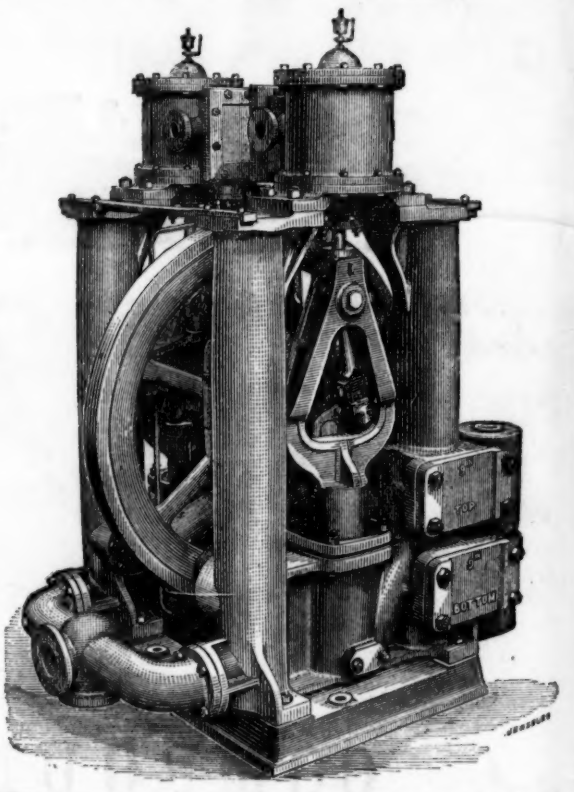

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